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Number 634

Thursday, January 4, 1979

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Briefing

Robots 79 conference

INDUSTRIAL robots in the UK will be the main topic of a four-day conference called Robots 79, to be held at the University of Warwick between March 27 and April 1. Experts in robotics will participate in four specific sessions, dealing with applications, new equipment, research and development trends, and the social and economic aspects and governmental involvement in a robot.

There will be a large display of industrial robots, and the event is organised by the British Robot Association, Bedford.

CS loss

While expanding rapidly in revenue terms, Mint Computer Systems Inc. of Elmwood, New York, looks like reporting a loss in its 1978 financial year, which ended on October 31, mainly because of a loss of nearly £100,000 in the fourth quarter. In the 1978 figures are complete, MCS expects to report sales of nearly \$12 million compared with less than \$14 million in 1977, when the company had a net profit of \$527,432.

Series date

WEDNESDAY, January 31 is the date pencilled in by the Football League for the announcement of the results of the 1978-79 season. The entry-level machine expected to be about four times as powerful as the 370/115 (11 times as previously reported) (CW, December 14), an Oransky analyst with the firm of New York, believes that IBM may aim its attention at users of mainframes from its competitors first 12 months of market, rather than at its own base.

al version

IBM System/34 is the latest line for which Cincom has implemented its database management system Total In-Ed in the US, the software is expected to be a multi-tasking version, a single copy of which can support multiple on-line tasks simultaneously.

Comp denial

ITE a firm denial by Mod- finance manager under Giles that either any was involved, Wall observers still say that and Gould are the unlikely companies seeking res- a full takeover and an 20 per cent stake in the A-based minicomputer.

PO pay dispute threat to Prestel and System X

DISCONTENT over pay among operations and programming staff in the Post Office's data processing service is threatening the operation of computer centres handling Prestel, Giro and PO billing and payroll applications, as well as the continuing development of the all-

electronic System X. Plans for strike action later this month have already been laid by the staff's union, the Society of Civil and Public Servants. The dispute centres around a regrading claim that seeks to give them parity with white-collar engineers in the PO.

"The claim is for about 1,400 computer staff," said an SCPS spokesman. "and has been made because we have fallen behind on pay. Some engineers earn up to £1,000 more than equivalent computer or clerical staff. This is one of the major reasons that we now see a turnover rate of about

20% a year for people in the data processing service." This is not only the concern of the PO data processing service, however, as the same problem has already been highlighted by SCPS deputy general secretary Campbell Christie, who is fighting for higher pay and better

conditions for all members. (CW, November 14, 1978). Against this background, however, a meeting of data processing staff was held in November at which the men voted by five to one to take

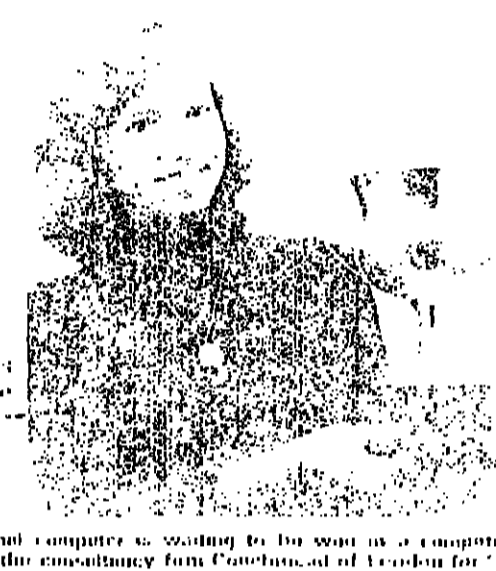
© Turn to page 10

United drops out of leasing

ONE of the best known third party computer lessors, United Leasing, is dropping out of the computer leasing business because of the rapid fall in the price of IBM CPUs. The chairman of United, Parry Mitchell, told Computer Weekly that United would probably stop writing leases of IBM machines by the middle of this year.

He said, "It has been estimated that CPU sales will account for no more than about 15 per cent of IBM's revenues by 1985. With CPUs costing no more than about \$100,000 by then it will not be worth remarketing them when the lease period terminates."

Asked to comment on whether he thought it would be worthwhile writing leases on CPUs in the future, Peter Doyle, president of the newly-formed European Computer Trading and Leasing Association (CW, November 24, 1978), said he expected that the percentage pro-



WIN A PET

A PET, personal computer is waiting to be won in a competition organised by the consultancy firm Comshare of London for The Computer Advertisement of the Year. It is intended to promote high standards in advertising design for computer products and services. Advertisements that have appeared in the UK Press since April 1978 are eligible for entry. There will be three categories: hardware, software, and computer-related products/services. The winner of each category will receive an entry to the Comshare competition by the deadline of March 31. The overall winner will receive the PET, worth £700.

There will be an entry fee of £10 for each ad submitted. All these fees will be donated to the BCS Specialist Group for the Disabled, as the prizes are being provided by Comshare. Entry forms can be obtained from Melissa Buss or Beverly Dellow on 01-235 4996.

50 firms at micro show

ONE of the most important events of 1979, Micro Systems '79, opens at the NEC Centre, Huddersfield, on Wednesday, January 31, and runs until Friday, February 2, and during the three days over 50 leading computer manufacturers will be displaying a range of microprocessors, microcomputers, and micro-based systems. It is a non-traditional event for a computer show.

Entrance to the show is free, but a £1.00 charge will be levied at the door for the use of the facilities. The show is organised by the British Computer Association (BCA) and is a joint venture with the British Computer Society (BCS). The show is expected to attract a large number of visitors, including many from the microcomputer industry.

Atom 'bomb' hits ICL shares

REPORTS that ICL could face problems over the use of American parts in 2800s on order for the Atomic Energy Authority, have wiped much of the shine off the company's share price.

Despite ICL confidence that the problem, which arises from a new US Act designed to curb the spread of nuclear weapon technology, will prove trivial, the shares have plunged 20 pence since the news broke. Euphoria over the company's strong performance in 1977-78 - profits of £37 million on turnover of £509 million (CW, December 21, 1978) has largely evaporated.

At issue are the Intel chips which will be used in the two dual 2870s and one 2880 processor on order for the UK Atomic Energy Authority under a £13 million contract (CW, September 14, 1978).

The new US Act, passed in March, requires that all US ex-

ports for use in nuclear technology, be approved by the US Department of Commerce since the establishments which will use the computers are not involved in nuclear weaponry. ICL is confident that approval will be granted with minimal delay.

Prof George on a winner

HAVING raised a few eyebrows in the world of football pools with his accurate forecasts of match results (CW, December 21/28), Professor Frank George, head of the cybernetics department at Brunel University, is turning his attention to horse-racing.

The accuracy of Professor George's Forecast 4 pools system was demonstrated on the December 22 television programme Thames at Six.

During this he predicted that three matches - Queens Park Rangers v Tottenham Hotspur, Aston Villa v Leeds United, Ipswich Town v Norwich City

would all be score draws. This was proved correct and the respective scores were: 2-2, 2-2 and 1-1. "I did mention that there was a small chance of Tottenham winning, but maybe I shouldn't have," said Professor George.

Now, he has turned his attention to aiding the racing pundits in their attempts to predict which horse will be first past the winning post.

Professor George says that the system, being written in Algol 60, will soon be up and running...

COMPUTER WEEKLY'S INSIDE NEWS

1984 AND ALL

THAT THE New Year brings a new Computer Weekly column and a chance for readers to win £5. In the spot previously filled by Interrupt, there now appears 1984 And All That.

With the booming mass media coverage of the so-called "silicon chip revolution", there is increasing reference outside the technical Press to aspects of information technology. The new column aims to monitor this information cloudburst, highlighting some of the strange and quirky ways in which our industry is viewed by the outside world. page 2

WRITE ON

A lively debate on the role of marketing literature and the computer Press leads a lively page of readers' letters. page 4

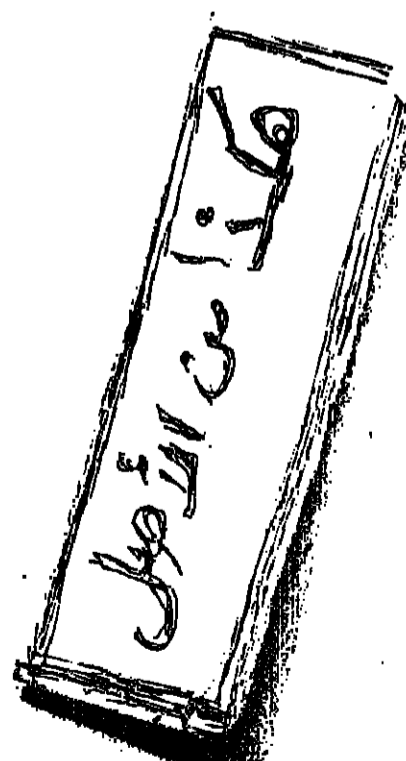
AD FLASHES

Millions of travellers on London Transport have their journeys brightened by flashes of knick-knacks and Virginia, shortening vodka experiences and other delights revealed on over 300,000 advertising poster sites. Robin Webster reports on a new computer system to help LT plan their poster displays. page 12

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A "Ten 8" disk - Half a Megabyte per disk
A "Ten 8" disk - Half a Megabyte per disk
A "Ten 8" disk - Half a Megabyte per diskThe government must
wake up to IT in '79

At the beginning of 1978, the Prime Minister must have been thinking of making a public declaration of a New Year resolution for the government. It would no doubt have read something like this: "We resolve to wake up to the importance and impact of microelectronics, and start doing something about it."

At the start of 1979, Computerview would like to take the opportunity of putting into words a New Year resolution for him for this year.

That resolution is that the government resolves to wake up to the importance and impact of IT. Information Technology (of which microelectronics is an important but subsidiary part). And then it must start doing something positive to encourage and support its development.

The government's current efforts in providing financial support for both the microelectronics manufacturing industry in this country, and the development of applications using new technology has been more than laudable.

It has shown itself capable of keeping pace (or at least catching up) with the times.

Its latest efforts to engender a greater awareness in industry of the potential of microelectronics (CW, December 21/28, 1978 and Micro News, page 9) are even more important.

For the first time the government has gone beyond providing money and prayers, and is attempting positively to pull industry by the nose.

These are good first steps, but of far more importance is where these microelectronic devices are used, rather than the things themselves. For example, there is now little distinction between telecommunications, office pro-

ducts and computers, all of which are heavy future users of microelectronics. These three previously distinct industrial sectors have converged to form an inter-related whole, which is information technology.

Government realisation of this (which is showing signs of dawning) is of fundamental importance, and support and encouragement for it are now essential.

This will require the government to take the real bull very firmly by the horns, rather than playing with the calf of microelectronics alone.

It is Computer Weekly's view that the government's tactics have been wrong, in theory at least. As first argued after the Hedsor Park conference in 1977 on the impact of information

technology, Computerview believes that the government plans should have been to help industry define and quantify new markets and production opportunities, show industry how the use of new information technology would help the attainment of these new goals, and then support the application and production of the new information technology components themselves.

However, what the government has actually achieved so far has been substantial. But the time has now come to make the fundamental step to support information technology and all that it implies.

Only then will the support already committed to applications and production of microelectronics prove worthwhile.

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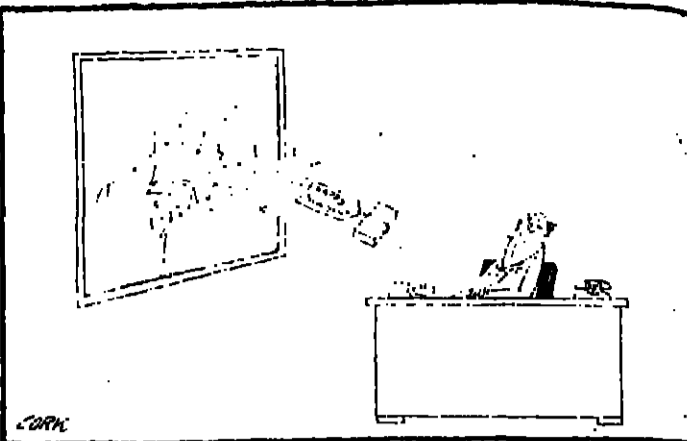
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Infoline launch will offer
dial-up access
to scientific databases

The UK's first multi-database public information retrieval service, Infoline, is due to start operating within the next few weeks. The system will provide British researchers with dial-up access to scientific bibliographic databases such as Inspec, Chemical Abstracts, and the

World Patents Index at lower cost than the US and European services currently available.

A dedicated Univac 1100 at the CRC bureau will provide the service, being joined by a second processor later this year. The first database to be available will be Derwent's World Patents Index, followed at stages by Chemical Abstracts, Inspec (Physics, Electronics, and Computers), Biosis (Biology), Compendex (Engineering), Rings (Pharmaceuticals), and Chemical Business Index.

Usage charges for the first two databases have been set at £50 per connect hour for WI and £32 per connect hour for the Chemical Abstracts bibliographic file. Ten access points or nodes are provided throughout the UK, with three in France and three in Germany. There will be an additional network charge except when using the London node.

This is a user of WIPI in March would pay £1 an hour for the network, plus about 90p for his phone call to the node in Warrington, making a total of £1.90. This compares with about £70 using the American Lockheed or SRI services to Eumet.

Thirteen 300 Megabyte disc drives will be used for storage; each database has in the region of one to two million records. The retrieval software is based from the Battelle Institute, with the front end greatly modified by Infoline's systems staff to make it easier for their particular customers to use.

Infoline is a joint enterprise of Dorwent Publications (part of the Thomson Organisation), The Institution of Electrical Engineers, the Chemical Society, the British Library, and the Department of Industry (CW, November 18, 1978 and June 18, 1977).

It could also have been the year of Data Protection. Owing to outside factors, the much heralded report only just scraped into 1978. The year of Data Protection has now been nominated for 1979, 1980, 1981.

Meanwhile Focus wishes all readers a successful data processing year ahead. May all your problems be micro-sized.

Whether DP management should be manning the micro barricades or joining the IDPM micro business users' club was the theme of the Micro Forum organised by Computer Weekly/IDPM. Micro ignorance will be far from bliss.

1978 was almost the year of the IDPM. Setting up administrative standards following the merger of the IDP and DPMA is apparently causing operational snags. If the IDPM wants to maintain its established role as the leading DP industry organisation, then more resources will have to be put into representing members' views.

Once again it was not the year of the operator. Their views - despite the efforts of Bernard Allen's Op Spot - have yet to penetrate the data ears of DP management. That operating is the most undervalued DP activity was made clear in a

LEASED LINES

R.R. come down from his wintery home in his tribe-powered sleigh to see the workers in St. James. He complained of difficulty in landing on the sloping roofs. If you think his sleigh is bad, you see his pulling. J.R. has successfully implemented his online system for clients' wants and exchanges. Now, he is in from anywhere in Europe to see if you have that CPU or those peripherals and software. After this monumental effort, J.R. has fallen in love again and was muttering something about taking in Waterbury Down. The plethora of equipment available last month was too much for you and so I list below only the choices nearest for you to really get your teeth into.

* 370/158 CPU 2 Megabytes, 1.5 C. Serial Number 5110685
Purchase Price £440,000
3 Year Lease: £12,600 per month

* 370/148 CPU 1 Megabyte, Serial Number 7380042
Purchase Price £318,000
3 Year Lease: £9,400 per month

* 3420 Model R Tape Drive, 0260 to 1, 1250 to 4
4 Year Lease: £340 per month each

We would like to wish all our readers a very happy Christmas and a prosperous New Year. If you are any customers or prospects actually reading this, who may be visiting London in the New Year, we will be pleased to offer you a valuable gift. Just send us your name and address. We will send you one of those little diaries to fit in with the pocket and the promise to be the first one to the top.

Happy Savings, M.P.M.

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Inflammatory?

USERS of the Post Office's Datapost service have missed a big treat this year, as they will already know if they read this expose in the Daily Mirror on the Friday before Christmas.

The lovely lady in the picture is just one of a bevy of scantily clad beauties who graced the pages of a calendar produced for the Post Office's postal marketing department as a promotion for Datapost by what the PO described as "a specialist outside agency."

According to the PO, the pictures and text were prepared separately, and when they were

put together the combination in some cases was such that it might have given offence. For that reason the calendars were burned.

The Daily Mirror said that 17,000 calendars were destroyed and that they cost £81,000 to produce.

Asked to comment on these figures, the PO said that only a small number were printed and that the cost was far less than £81,000.

Datapost is a high speed postal service for computer media like magnetic tapes and punched cards.

Postal bosses
burn a load of
sexy calendars

By PETER KANE

NEARLY 17,000 sexy Christmas calendars have gone up in smoke because they were too hot for the Post Office.

Postal bosses ordered the calendars to be burned "on the grounds that they were too hot for the Post Office."

SEXY. One of the banned pictures.

Prime network
software

PRIME Computers may be ready to move heavily into distributed network software following the hiring by Prime of a key Digital Equipment Corp executive, Nathan Teichholz (writes Hesh Wiener).

Teichholz was until recently one of the managers of DEC's Decnet projects. Earlier the MIT-educated programming expert was a key developer of the RSTS time-sharing system for the PDP11 series.

Backbench dissension
threatens Freedom
of Information Bill

DISSENSION among backbench MPs supporting a Freedom of Information Bill is threatening the Bill's chances of being enacted during this Parliament. Only a rudimentary Bill is likely to get past government delaying tactics, and Labour supporters would like to see a simple repeal of Section 2 of the Official Secrets Act passed, while Conservatives think this is a diversion from the central issue of public access to government documents.

Liberal MP Clement Freud (Isle of Ely) won the ballot for Private Members' Bills, and was persuaded to give his place to the Freedom of Information Bill, even though he has not been a prominent member of the campaign hitherto (CW, November 30, 1978).

The government is not keen on a statutory right for the public to have access to official documents, despite a manifesto commitment to the idea. No official government review on Freud's bill has yet been stated, but it is thought unlikely that

the Cabinet will oppose it openly, for appearances' sake. Practical objections and delaying tactics are thought more likely. Tony Benn and Michael Foot may well support the Bill.

In the Bill's present form the first clause is the repeal of Section 2, the bane of the left wing and the basis of recent secret trials. The following clauses establish the right of public access.

It is thought that the most militant Labour supporters are prepared to lose all the rest of the Bill, as long as the first clause gets through.

NCR pay offer

FOLLOWING a meeting on December 20, an improved pay offer has been made by NCR to its engineers. It includes payments ranging from £140 to £200, plus a 5% increase in basic pay. This has been recommended for acceptance by the ASTMS negotiating committee. A decision will be known on January 10.

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New word processor

A NEW model of word processor, the WS80, that can have either single or dual key stations, has been introduced by Digital Equipment. It is similar to the existing stand-alone model, the WS78, but has an improved screen and is intended to replace the earlier machine eventually.

At the same time, DEC has started to sell its word processors in the UK itself. Hitherto they have been available here only from Hamilton Rentals. A single-screen WS80 with one twin floppy disc unit costs £11,130, while a WS80 with two

screens and two twin floppy units (four drives in all) costs £15,280, bringing the price per screen down considerably.

The new screen can display characters in three different sizes and also in reverse video. The same screen is used by DEC's mid-range shared logic system, the WS200, which can have up to nine screens and three printers (these latter being either DEC dot matrix printers or Diablo daisy wheel units).

The WS200 costs from £23,610 net terminal. It uses cartridge tape for main storage; peripheral also have auxiliary floppy discs.

Downtime

by Chad

Red tape and type

ISN'T it nice how people out there in the big world think we computer people are supermen, and that our machines can do anything? I remember at the time of the moon landings, some one wrote to London's Evening Standard asking why these wonderful computers that had guided the men to the moon weren't being used to solve our earthbound problems of overpopulation, starvation and unemployment.

Are they more sophisticated now? Well, there are plenty of people who think computers are going to take over the world, or help Hitler come back from the dead. On a smaller scale, see this remark from an article on computers in Red Tape (great title!) the magazine of the Civil and Public Servants' Association: "One word processor, it is said, will replace ten typists, and it costs about £5,000."

How do we get it across to all the civil servants who are panicking that, with luck and a following wind, one word processor will replace one typist, and £5,000 is distinctly at the bargain end of the market? Mind you, later on in the article the author says that the industrial Revolution took place in the 1870s, and that strikes a pretty severe blow to her credibility.

IBM please copy...

"IN the foreground, the sea. Behind Mount Fuji with its corona of eternal snows. All around, the finest tea plantations in Japan. An ideal situation for a monastery, this is the setting chosen by Fujitsu for its new computer factory. Peace and solitude. Every necessary condition met to enable the 1,200 employees to produce harmoniously. Thus the 300 celibates, young girls in the main, need not concern themselves with a daily journey to work. The company provides cells - sorry, studios - within the womb of the factory."

"Chaperones and provisioners protect them from the outside world. And within this 'Namatsu complex', inaugurated in 1978, engineers are putting the final touches to what they describe as 'the biggest computer in the world'..." Jean-Michel Quatrepoint, Le Monde, on the manufacture of the first Fujitsu M-200 large-scale IBM compatible mainframe.

Aptitude tests

I WAS concerned to see your "Aptitude tests 'meaningless' report" (CW, December 12, 1978). The tenor of the article on (Cinch University's) research was that all aptitude tests had been demonstrated to provide meaningless results, yet the last column suggests that only one test had been studied.

I must point out that there are other programming aptitude tests available which practical managers in DP find very helpful. For example, the BIS Aptitude Test has been used during the last ten years in the

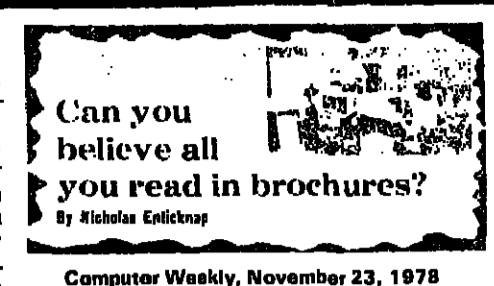
LETTERS TO THE EDITOR

TWO Computer Weekly readers have taken vehement exception to my article "Can you believe all you read in brochures?" (CW, November 23, 1978), writes Nicholas Enticknap.

I find the violence of the opinions expressed in both letters (see below) rather mystifying, as the facts they adduce in support of them are meagre, and are with one exception either complementary to my article or a duplication of points that I made.

However, the significant objection to both letters is that they have entirely missed the point. I was not writing a critique of the VAX. I was not attacking the VAX either. The fact that the report I was quoting related to the VAX was incidental by my argument. The subject I was discussing was, as the headline made clear, the validity of the descriptive language used in brochures.

Dr Maden's comments on the degree of compatibility he has found between RSX-11M and VAX are therefore far from damaging to my article; in fact they provide



Computer Weekly, November 23, 1978

good supporting evidence for the point that compatibility is not an absolute term and needs defining.

Mr Wisner is right on one point. The address range of the VAX is 512 Mbytes. I apologise to anyone who was misled by this slip.

His other points, however, merely repeat parts of my article. I said, "For DEC a word is equal to 16 bits, whatever machine is being referred to". I said that on the VAX "32 bits

is the maximum number that can be operated upon at any one time in parallel."

I concluded, "DEC is entitled to call the VAX a 32-bit machine," and elsewhere described the opinion that it was a 16-bit machine quite unequivocally as "wrong". How, after having made all these points as explicitly as I did, I can have left Mr Wisner with the contrary impression I completely fail to understand.

I hope that my article convinced at any rate the majority of my readers of two things: that manufacturers have a duty to be meticulous in the terms they use in their brochures, and that readers should be careful about what they understand from them. My article, and these responses to it, demonstrate clearly that readers can very easily misunderstand what they read.

It is impossible to stress too strongly the principle "caveat emptor". It should be borne in mind at every stage by all intending purchasers of every kind of computer equipment.

Putting the record straight

THE article by Martin Hudson in your December 7 issue refers to Honeywell's current computer range as being "long overdue for replacement" and to the company's profits as having "slipped badly in recent years".

Neither of these statements bears the most superficial inspection. Series 60 (the current range) was announced less than five years ago and has been progressively and comprehensively enhanced.

Profits in recent years, far from slipping, have consistently increased from \$67.1 million in 1974 to \$77.8 million in 1975, to \$113.1 million in 1976 and to \$145.1 million in 1977, with the first nine months of this year showing earnings of \$125.3 million compared with \$96.5 million in the same period last year.

The article questions the availability of sufficient resources at Honeywell to counter the challenge of replacing the Series 60 family, yet the company's spending on computer R & D this year exceeds \$200 million and will continue to exceed this figure in 1979.

As for Mr Hudson's other area of concern, database software, not only is this "excellent" (your contributor's own word) but it is also available - and excellent! - on smaller Series 60 systems for which database software was announced more than a year ago, a fact seemingly unknown to your contributor.

All the points I make here are public knowledge, and it seems quite extraordinary that Mr Hudson has failed to inform himself about them.

J. DUNCAN
Director
General Systems Division
Honeywell

Computing in schools

DAVID Tinsley's "cri de coeur" on the failure of schools to keep up with technology (CW, December 7) will not go unnoticed. But there are two aspects to be considered. One is the extended use of the TV in the schools via systems such as Frontal. This seems a natural development.

The other aspect is more controversial. Are schools, even assuming the availability of micro-based computer systems, to undertake computer studies on a large scale?

Industry, commerce and the public sector continue to hope for a supply of young people of age 16+, well grounded in English and numeracy and of a reasonable general educational standard. (The high-fliers of 16+ readily absorb computer concepts at universities and polytechnics without previous school computer studies.)

This is not to deny to the schools some hardware provision for such pioneer centres as London and Birmingham, but one would hope that the government would give priority to the rapid build-up of a sound infrastructure of computer personnel on which to base a flourishing micro-processor industry.

M. BRIDGER
Member of the BEC/TEC Committee for Computer Studies.

A-changin' the Times

YOUR editorial entitled The Thunderer Silenced (CW, December 7) fails in two respects to grasp the significance of the "New Technology" dispute.

First of all, it is naive to assume that the executives of the National Graphical Association, and the other unions involved, have failed to inform themselves of the precise nature of computer typesetting systems. Indeed, it appears that they are better informed than you. More detailed research for your article would have revealed that there is a significant "deskilling factor" involved. It would be difficult to argue otherwise, since proportional spacing, line filling, and many other functions accomplished manually on hot-metal systems are semi- or completely automatic on computerised systems.

Why not be honest, and then perhaps the workers involved might be prepared to admit that operating hot-metal equipment is boring and unpleasant, and be prepared to accept retraining?

J. G. BROOKS
Croydon, Surrey

The Editor welcomes letters on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

Mini-makers 'burying heads in sand' on Series 1

MINICOMPUTER manufacturers are burying their heads in the sand rather than facing up to the threat of the Series 1. This is one of the main conclusions to be drawn from a new market survey, "IBM Series 1 in Europe", from Input.

The report investigates in detail the success of the Series 1 to date and the reasons for it. It examines the Series 1 in relation to IBM's overall plans, its impact on the minicomputer competition, and the opportunities it provides for systems houses and plug-compatible manufacturers. It also takes a close look at users' experiences to date, and discusses the implications.

The report finds that Series 1 was not intended as a challenge to the minicomputer market, but as a defensive move to protect the mainframe market against the threat imposed by the general trend towards distributed processing systems. This, feels Input, explains apparent anomalies such as the poor software support and the lack of quality discounts.

Notwithstanding this, Input expects the Series 1 to make a big impact on the minicomputer market very soon, and to capture as much as 26 per cent of shipments at the peak of its sales curve in 1981.

Unrecognised by many minicomputer manufacturers, this impact has already begun with the loss of potential sales of systems for connection to large 370s.

The main factors that prompt users to choose Series 1 are identified by Input as IBM's reputation, the competitive

price, and the modularity of the hardware. The early users are not yet convinced of the value of the product, but in general are confident that IBM will attend to their complaints in time.

The vast majority of systems are used for commercial and business applications. The most popular of these are inventory control, sales ledger and analysis, and invoicing.

IBM Series 1 in Europe, \$5,000. Available from Graham Kemp, Input, Empire House, 411, Chiswick High Road, London W4 5LE. Telephone 01-895-5307.

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NEWS IN BRIEF

NCR adds to the 8400 line

FILLING out its mid-range, NCR has added an entry-level model in its 8400 line. At present offered only in the US, the 1-3410 is designed to ease the migration path into NCR's top-end Criterion 8500 and 8600 machines for users of systems in the 1-8100 and 1-8200 lines, allowing direct migration of software with no conversion.

The 8400 line offers models operating in "I" (interactive), "V" (virtual) and "N" (normal or batch) modes. The 8400s are built around the same 16-bit processor that is used as a front-end in the 8500 line.

£1.7m DEC deal

COMPUTER Marketing of West Thurrock, Essex, has signed a contract with Digital Equipment under which the Essex firm will buy £1.7 million worth of equipment from DEC, including nearly 650,000 worth of LSI-11 microcomputer boards and components.

IBM aims to attract more shareholders

FOR the first time since the 1930s it should be possible to buy an IBM share for less than \$100 later this year. After failing for two years to fulfil the prediction of New York stock analyst Harry Edelson, of Drexel Burnham, that the computer giant would make its shares more marketable by making a share split (CW, January 13, 1977), IBM has finally taken the plunge and now proposes to offer holders four new shares in exchange for each share they presently hold. The date set for the split is as soon as possible after May 10, provided that the move is approved at the annual meeting on April 30.

Announced in the week before Christmas, news of the split, coupled with a 13.4% boost in the quarterly dividend, was an immediate tonic to the share price, which rose \$12.75 to \$283. If this price is held until the split is made, the new shares would be valued at \$70.

The attraction of a lower share price is that smaller investors can afford to hold them.

Several reasons for the move were given by New York stock analysts. Wider ownership would lead to more people supporting IBM in battles with the government, it was said; more potential buyers for the shares would lead to a higher share price; and wider ownership would make the company better known and therefore a more viable contender in the consumer market for personal computers.

All were largely dismissed by chairman and chief executive Frank Cary.

"We are taking this action to bring our stock into a more competitive position in relation to the stocks of other quality companies," he told the Wall Street Journal.

Specialists meet

ON February 7, the BCS Data Communications Specialist Group will hold a one-day meeting at Birkbeck College on distributed computing. Following the group's annual meeting in the morning, the meeting will feature speakers from ICL, IBM and DEC and will end with an open panel discussion.

Manager moves

MEMOREX area sales manager, Colin Cook, has left to take up the new post of managing director at Storage Technology Ltd. He replaces North European sales director Colin Madeley, who departs for family reasons.

Agreement

ZYGAL DYNAMICS of Chesham, Bucks, has signed an agreement with the US-based daisy wheel printer manufacturer, Diablo, under which Zygat will buy \$3 million worth of printers from Diablo over the next three years. Zygat says that it has shipped more than \$1 million of Diablo equipment over the past two and a half years.

Portable

A COMPLETELY portable hospital computer system for acquiring cardio-nuclear data from gamma cameras for offline processing has been introduced by Digital Equipment. Known as the MDA-11 and based on DEC's PDP-11/03 minicomputer, it features new Gamma-11 software, including specific cardiac routines, and costs £10,000.

500 more

FOLLOWING an order placed by National Westminster Bank for 2,000 terminals based on the Burroughs B30 small processor, Barclays Bank has ordered 500 similar worth more than £4 million to be installed at its branches in the UK as the first phase of a programme to replace Burroughs TC 500 and TC 3500 units.

Peerage for Brian Flowers

A LIFE peerage has been conferred on Professor Sir Brian Flowers, Rector of Imperial College, London, in the New Year Honours. Sir Brian, who received his knighthood in the 1969 Birthday Honours, was chairman of the Science Research Council from 1967 to 1973, but is perhaps best known in computer circles for the joint working group on computers for research, of which he was chairman in 1965. The report provided a basis upon which most university computing in the UK was established.

Other awards included MBEs for Geoffrey Bull, a project team leader with BP Oil, and Gordon Molins, a seminar co-ordinator at NCR. He is mainly concerned with retail trade systems including point-of-sale applications.

NCR for K Mart

DISCOUNT store chain K Mart, which has about 1,400 retail stores coast-to-coast in the US has ordered over \$10 million worth of NCR point-of-sale equipment.



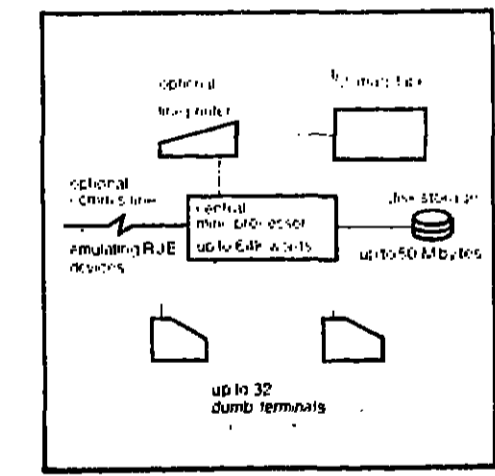
Rosamund is Salesman of the Month

FOUR weeks after transferring to ICL's sales team, Rosamund Appleby achieved an £84,000 order and won the company's Southern region Salesman of the Month award for outstanding performance. Her customer was fire alarm and hotel audio system specialist Sound Diffusion of Havre, Sussex, which bought a System Ten 220 along with ICL's Safes protection control package. Before joining ICL two years ago to work as a systems executive advising customers and potential customers on systems implementation and applications, Rosamund had considerable experience as an analyst and operated her own data preparation bureau in Brighton.

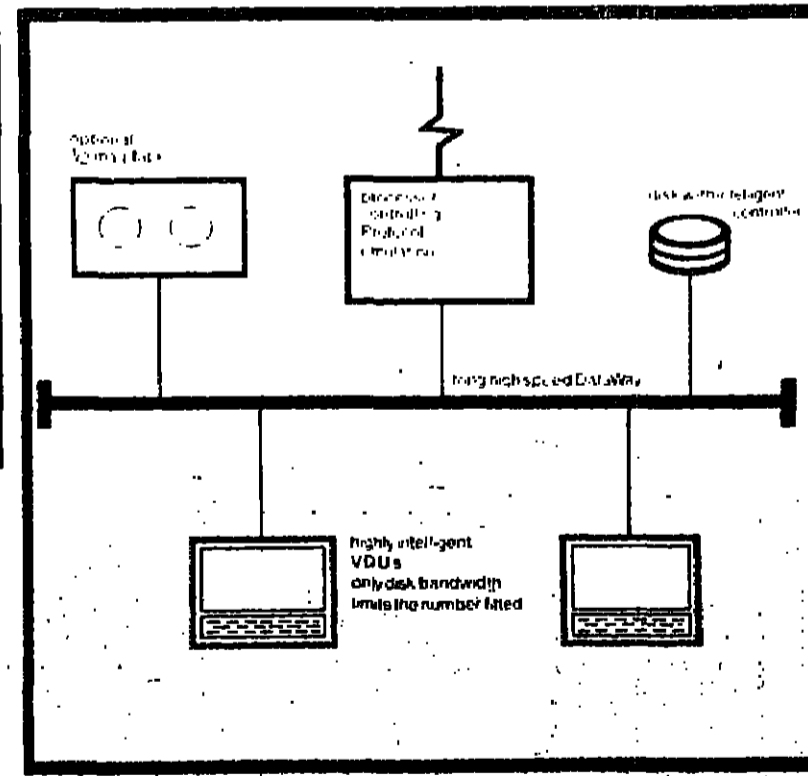
Here, Tony Hadaway, Southern Region Sales Manager, presents Rosamund with her award, a digi-clock encapsulated in clear plastic.

CMC SOVEREIGN

First on the DataWay



A traditional key-to-disk system with every peripheral dependent on one central processor. From 1968-78, though, the most advanced method of bulk data entry.



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CMC SOVEREIGN is a data entry system which uses the revolutionary CMC developed DataWay technique for linking a multiplicity of processors.

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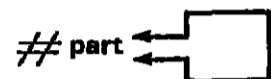
Head Office and Manufacturing: Market Place, Hemel Hempstead, Herts. HP1 1TA. Telephone 0462 61266.

RELATIONAL DATABASES

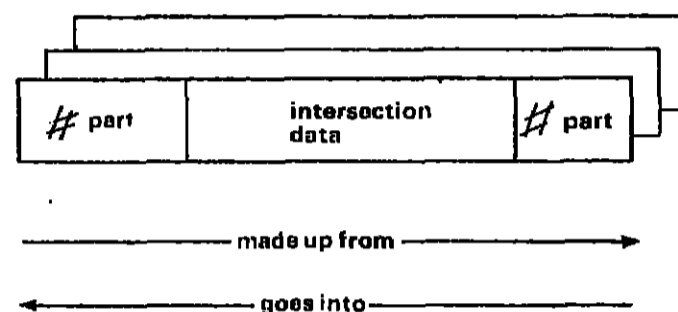
One link in the chain

THIS is the last article in the present series. Parts 8 and 9 examined complex sets of relationships in some detail. This week we will conclude with an examination of the bill-of-materials type of relationship and will propose a more general relationship diagram notation. I conclude with a brief look at the close connection between relational design and structured programming.

Bill-of-materials (involutive) relationships: A data item can be directly related to itself. This is a characteristic of the bill-of-materials application where a part may be a component of several other parts, and it may itself be built up from several other parts; there is thus an n-to-n relationship between data item #part and itself. BOM structures can be represented on a relationship diagram by:



The FNF implementation is a file with two principal fields: a "made-up-from" #part and a "goes-into" #part. Extra fields can be added to contain intersection data particular to the relationship between one part and another; a typical extra field holds the quantity of one part used to build another part. The file would hold records of the following nature:



It is, however, difficult to draw a clear and unambiguous relationship diagram for a BOM structure which has, as it usually does in practice, intersection data.

General notation: The heavy reliance upon relationship diagrams makes it necessary to ensure that the diagrams themselves are unambiguous even for the most abstruse kinds of data relationship. One suspect is the symbol

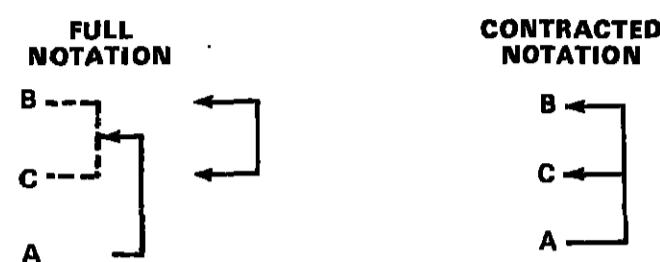


since it implies two separate concepts: an n-to-n relationship between B and C and an n-to-1 relationship between the concatenation B, C and data item A.

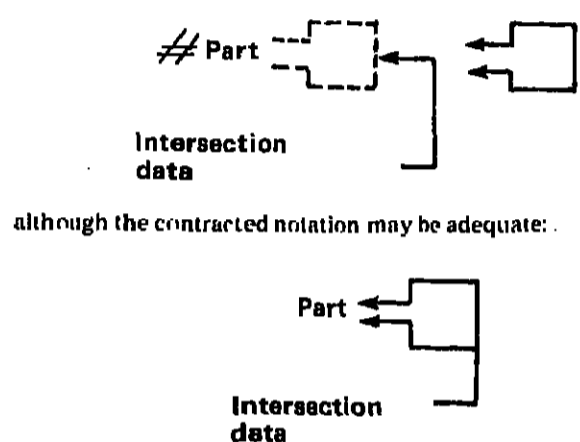
A more general notation exists which separates the concatenation of data items from the relationship between the concatenated items. The general symbol for concatenation is



with the obvious extension to more than two concatenated data items. Note that no arrow-heads appear. The following two diagrams are then equivalent:



The general relationship diagram or notation for a BOM structure with an intersection data item is:



The future: At the very beginning of this series the likely consequences of IBM's relational database stance were explored. But what of IMS, IBM's mainline database/data communication

Part 10
By Max
Stewart

This week Max Stewart concludes his 10-part tutorial series, using a bill-of-materials routine to demonstrate relationships. Stewart is divisional technical support manager at the Bathgate plant of Leyland Vehicles, the commercial vehicle section of BL.

package and probably the most complex and controversial system of its type extant?

Ted Codd, of IBM San Jose, demonstrated the potential of relational systems as long ago as 1970, not long after IMS became available, and in spite of IBM's cast-iron commitment to IMS there is a strong body of opinion both within and without IBM that the future lies in that direction. But IMS has a certain mystique; anyone with a feel for "bidirectional physical twin pointers" and "virtual logical children" has the IMS equivalent of a Masonic handshake. Nevertheless, even some of its fondest adherents feel that IMS has "grewed like Topsy" and is a little dated. And its critics...

Conclusion: Readers who have borne with me thus far and have still retained some enthusiasm may be forgiven for thinking that relational design is claimed to be a complete systems methodology. It isn't. It is one link in a chain:

● Decide on report or screen formats — analysis.

● Decide which source data items are needed (including those supplied interactively) — analysis.

● Create file or database structures with these data items — relational design.

● Decide how to process input files/screens to produce reports, output screens or files — structured design à la Jackson.

Structured design and relational design are complementary, fit neatly together and have the same objective: to produce clean designs based on data relationships rather than upon some arbitrary and machine-orientated idea of how we should process these data. Mike Jackson has said when writing about structured program design: "The computer system sees the world through the medium of its data structures. ... If, therefore, we give our program the same structure as the data it processes we can expect that we will have no difficulty in making an intelligible and correct program."

To which we can add: "... and if we can ensure that these data structures mirror the real world, we are doubly blessed".

* Principles of Program Design, Academic Press (1975)

GILB'S MYTHODOLOGY
Learning from experience

WE ARE all weighted down with an unfortunate tradition. Within the professional memory of most of the senior practitioners of data processing, the hardware and software systems we worked with were so simple that we were able to understand them and to guess reasonably well at most of their technical and economic characteristics, by learning about their inner workings.

I think the point where I began to realise that such methods were inappropriate was with the announcement of IBM's 360 series, the 360 Operating System and, not least, PL/I. I still made desperate efforts to understand the inner workings of the systems, since I apparently had a responsibility to do so, but gradually I began to understand that I really didn't and couldn't understand what the essential attributes of these systems were by using this method.

My embarrassment was reduced by the growing recognition that nobody else at IBM, particularly the people who produced the software, seemed to understand the consequences of what they had patched together. As a consequence of this growing recognition, I began to develop and practise methods of increasing our ability to understand complex hardware/software systems. Almost all of my professional associates, students and clients

have seemed to feel the same need for better tools, and have made use of them and helped me develop them for the past 10 years. I have shared some of these tools with readers of this column.

These methods you may remember as MECCA (Multi Element Component Comparison and Analysis), Formal Project Goal setting (Metrics Matrix), and Function/Attribute/Component Table. Several of my pieces have dealt with more specialised details of this perception process, such as portability measurement.

There is one common element to all of these methods. It is that we no longer ask about the internal structure of a method as a major tool to understanding it. We ask first for experience data about the expected attributes of the method, the hardware or the software.

The systems we are faced with are all so complex that only experience data gives us a reasonably trustworthy view of the cumulative effect of all the details inside these black boxes.

The attribute questions we ask are related primarily to the primary and critical goals we ourselves are interested in controlling. But typically we are looking at attributes such as costs, learning difficulty, maintenance ease, failure rates, performance, implementation ease and similar qualities, which if uncontrolled can spell disaster for our projects.

This is, of course, just good common sense, and is applied to many complex disciplines, including, to some degree, our own. But it is still difficult to pick up a professional DP publication and find that almost all articles, papers and discussions are still not approaching this issue directly through experience data. They are still describing the logical structure alternatives of distributed databases, and the latest variations on structured logic. They are not posing hard questions such as measurable effects on reliability, maintainability, portability and costs.

Naturally these questions are more difficult to answer. But the answers may be critical to the credibility of our profession. At the moment I believe that I can safely state that we

have already lost our credibility in the eyes of others. There is hope for each of us, if we get into the habit of asking hard nosed questions of the sellers of new ideas surrounding us. Tell them that before they launch into their glorious detail about the insides of the black box, you want to know some facts, quantitatively, about the multi-dimensional attributes of their magic.

If these are interesting enough you won't have to look inside. If they are not interesting enough, you won't want to look inside.

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SOFTWARE FILE

Transportability is key
aim for Fortran

PROVISION in the language standard for the transportability of Fortran programs is one of the major goals set itself by the ANSI X3J3 committee which is working on the next standard, due to appear in 1982.

It was one of several goals of the current work identified at the British Computer Society's Fortran Forum 78 by Martin Greenfield, vice-chairman of X3J3 since 1962.

Transportability, he said, was one way of meeting the requirement for greater program portability. What was envisaged was that programs should adapt to the characteristics of the host processor; what the standard would have to do was define processor characteristics in a portable way.

A definition of the processor environment would be likely to take the form of a table at the start of the program. The form chosen could represent a standardisation of similar methods already used by those implementing transportable software, such as the Numerical Algorithm Group.

One major problem likely to be addressed is that of REAL. Fortran 77 here made no advance over the 1966 standard, leaving unchanged the definition of a Fortran REAL as an "approximation" to a real number.

It was noted by one of the speakers at the Forum that the failure of the standard to specify a degree of approximation in theory left the door open for extreme interpretations — for example, a fraction might be truncated to an integer without violating the standard.

A speaker from Sweden, I.

Dahlstrand of Lund University, later vividly illustrated the problem of program portability and processor word-size with an example of the same program giving four different results.

The code
K=5000000
L=K*K
WRITE L

yielded, he said, COMPILE TIME ERROR on one 24-bit machine, RUN TIME ERROR on a 32-bit machine, an incorrect result (through truncation) on some machines and — on a few machines — the right result.

This, he suggested, was unacceptable in an age when com-

puter systems were used for "building bridges, and making moon shots. If, as has been suggested, Fortran will be with us for another 100 or 150 years, this degree of machine dependence cannot go on."

Several incidents during the day highlighted the often cited fact that most users have a poor knowledge of what is in the standard.

Describing a survey of UK opinion on what should appear in Fortran 82, David Musworthy, of the Edinburgh Regional Computing Centre, observed that many respondents suggested features already in Fortran 77 while some requested features

that had already been present in the 1966 standard.

A related questionnaire, he said, had shown that portability, simplicity, and ease of use were generally seen as the chief merits of Fortran. A considerable body of users felt therefore that extensions were more likely to be damaging than beneficial.

Among those who favoured further development, proposals for new control structures, looping for example, were by far the most popular.

Least wanted were facilities for recursions, labels as a new data type, and a change which would make blanks significant in program source.

Machine-independent front
end makes RTL/2 portable

FOLLOWING the announcement of a "portable" Fortran 77 compiler (Software File, November 30, 1978), HPAC has revealed that it is close to completing the development of a similar RTL/2 processor.

Partly backed by Computer Automation, the software will be available first on CA's latest processors — the Naked Mini 4 and its code-compatible packaged version the Alpha LSI-4.

HPAC will subsequently be able to supply compilers for a variety of processors, including the Data General Nova and Interdata 16-bit and 32-bit machines, as well as the earlier CA Naked Mini 2 and Alpha LSI-2 systems.

This is because the RTL/2 front-end — like all HPAC compilers — is written in BCPL and generates a machine-independent intermediate code. Likewise, the same code is produced regardless of the high-level language being processed, so that only one back-end need be written per machine.

HPAC managing director described this approach as "orthogonal design: the front-ends are portable across machines, and the back-ends are portable across languages."

One of the effects of this architecture is that languages can be freely interfaced. As with HPAC's Fortran, RTL/2 programs will be able to call Coral subroutines.

Provisionally scheduled for release next April, the RTL/2 compiler represents a significant departure for the language in that it will be the first not to use the "official" front-end.

Originally written and still owned by ICL, this has been the "root" of the large range of

compilers developed by SPL for the language. More recently, it has also been licensed to Software Sciences, which is developing software for the Data General Nova and Texas Instruments 990-9900 family.

The existence of a common front-end has so far made a major contribution to the rapid development of a "frozen" standard for the language. An important selling point for RTL/2 — this is to be backed up early this year by the publication of a British Standard specification.

HPAC's implementation will conform meticulously to the existing definition of the language, and the company has undertaken not to include any enhancements, apart from a complete ISO-7 character set, without the agreement of the "appropriate parties".

It believes, however, that computer languages, like natural languages, must grow if they are not to die. It has therefore designed its compiler to allow for enhancements, should they be agreed.

While RTL/2 is probably most widely used on DEC PDP-11 systems, SPL has developed compilers for most widely used minicomputers. In particular, it has already supplied users with versions for Interdata 32-bit machines (Software File, April 27, 1978) and CA's LSI-2 (Software File, November 17, 1977).

Commenting on the fact that SPL had not produced a version

for the LSI-4, a spokesman pointed to a number of more urgent implementations currently under way, including compilers for the DEC VAX-11/780, the IBM Series 1, the Hewlett-Packard 1000, the DEC system 10, as well as "portable" microprocessor RTL/2 (CW, September 14, 1978).

"In standard Basic we would have no alternative but to replace a mental concept 'if x is negative' by a test for X >= 0."

"More seriously, there has been no challenge to my three main points: (1) Statements that Basic has an inherent advantage over other languages in being interpreted are based on ignorance of requirements for interpretation and compilation. (2) Basic conceals the task of programming by forcing one to outwit the logic of the algorithm. (3) Basic, as a language, is no more interactive than Fortran, Cobol or Algol."

EDITED BY PETER HEWITT



On the board

Neil Pollock, MBE, a former director of management services for British Steel, has joined the board of F International. A member of the National Committee on Computer Networks, Pollock was responsible while at BSC for a major strategic computer and telecommunications development, and directed a specialist staff totalling over 250. He has also had considerable experience of organisational studies. Prior to his appointment as a director, he has been working in a consultative role with F International at board level.

PROGRAMMER NOTES

A CORRESPONDENT who pointed out some common misconceptions about the virtues of Basic (Letters, November 16, 1978) has written again to contest a claimed counter-example.

J. A. T. Maddison, of Thames Polytechnic, writes: "The example used in my earlier letter to show how Basic requires the use of a contorted logic was chosen to be self-evidently clear in its effect. However, this escape route is rarely open, and my example could easily be altered to close it."

80 IF X = 0 THEN 100
90 LET X = -X (or LET X = ABS(X))
95 LET N = N + 1
100

"In standard Basic we would have no alternative but to replace a mental concept 'if x is negative' by a test for X >= 0."

"More seriously, there has been no challenge to my three main points: (1) Statements that Basic has an inherent advantage over other languages in being interpreted are based on ignorance of requirements for interpretation and compilation. (2) Basic conceals the task of programming by forcing one to outwit the logic of the algorithm. (3) Basic, as a language, is no more interactive than Fortran, Cobol or Algol."

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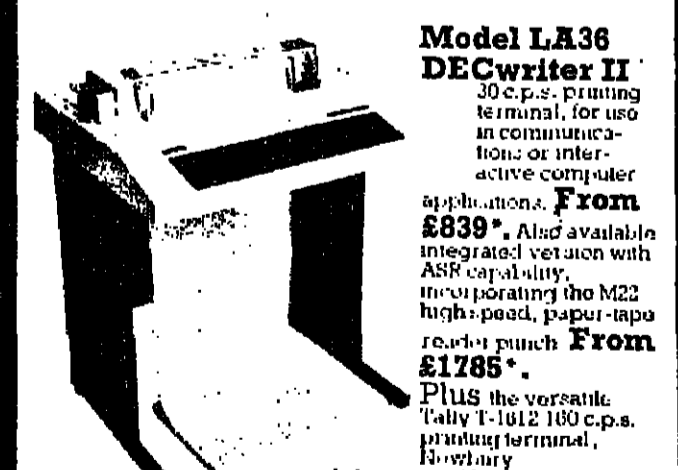
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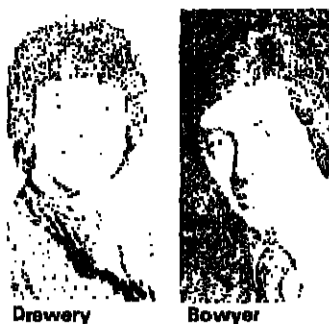
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PEOPLE AND EVENTS



Maggie Drewery has become an area sales manager with BCS International. She was previously a sales executive with MDS.

DIARY

JANUARY 8
Software Design techniques — data networks, FR L1 N. Robertson, BCS East Anglia branch, Thomas Paine Hotel, Thetford, 10.00.

JANUARY 8
Fardet switching, an overview, T. W. Adams, J. O. Welland, I.E.S. Savoy Place, London W2 2 7JW.

JANUARY 8
Computer education in schools, P. Shorro, BCS NW London branch, 7-Market Teachers centre, W. London, Railway Hotel, Greenford, 19.30.

JANUARY 8
Computers in retail distribution, J. E. Blake, BCS Croydon branch, Fairfield Halls, Croydon, 19.15.

JANUARY 8
National police computer system at the police command and control systems, IRTM, W of London, to Oxford branch, Bull Hotel, Gerrards Cross, 20.00.

JANUARY 8
Computer fraud, how control and lose your money, J. M. Ross, I.E.S. Reading branch, Cooper Inn, Pangbourne, 20.00.

JANUARY 8
Visit to British Rail, Nottingham 2900 evening, BCS Nottingham branch, Nottingham, 19.30, 14 0602-9511, ext. 26-3.

JANUARY 10
The impact on business organisation of rapid technological change, ICS Business Information Systems group, City University, London EC1 4 3JW.

JANUARY 10
New technology and its effect on ICS, Barry Ashdown, BCS Microform group, NW London NW1 1630.

JANUARY 10
Computer fraud, J. J. Kenny, BCS N London branch, West Lodge Park Hotel, Cockfosters, 19.45.

JANUARY 10
Viewdata systems, BCS Kingston branch, Kingston Management Centre, New Malden, Surrey, 19.30.

JANUARY 10
Shaw, chairman of ICS branches, BCS Hampshire branch, The Tabby Cat, Chichester, 19.00.

JANUARY 10-11
"Data management group, Mount Royal Hotel, London, 14.00.

JANUARY 11
Teaching laboratories for microcomputers, Microprocessor Application Group, I.E.S. Savoy Place, London WC2 2 7JW.

JANUARY 11
TP Monitor, BCS Kent branch, Computing Lab University of Kent at Canterbury, 19.45.

JANUARY 11
Would you recognise a good computer if you saw one, Geoff Newell, BCS Oxford branch, Oxford Europa Motor Lodge Hotel, Oxford, 19.45.

JANUARY 11
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International research director for Prime

PRIME has appointed a new director for its International Research and Development centre, based at Bedford. He is David Cheesman, formerly director of small systems (international) support with Univac. In his new position, Cheesman will be responsible for the development of an APL interpreter, research into cellular computing, interlinking Prime machines, and the development of a front end communications controller.

Cheesman was previously Director of Small Systems (International) Support with Univac, where he was involved in the support of minicomputer and small business systems for Sperry Univac throughout the world. Prior to this, Cheesman

worked with Honeywell Information Systems as Manager of Research and Development at Hemel Hempstead, involved in minicomputer development.

Alan Grimes has been appointed executive of the computer and electronic air and road distribution services at Alltranspore International. He was previously a sales executive within the company's air division.

Roy Whithear is joining Computer Technology as director responsible for finance and administration. He will leave Kingston Council, where he held a similar position, at the end of December.

Tony Seaman has been appointed UK sales manager for commercial and technical services, within the data services division of Control Data. He was formerly Cyber sales manager for the South with the company. Eric Taylor has been promoted to the position of manager, special projects, formerly being employed as Cyber sales manager for the North-West.

Now Midlands sales manager, Dave Schindler was previously a salesman for Control Data. Geoff White, formerly a senior Cyber sales manager, has been made Northern sales manager. A former salesman with the company, Peter Heath has become sales manager for Southern England. The new South-East sales manager, Ian Bridgeman, previously worked as a Cyber salesman.

JANUARY 15
Student papers on computing, BCS Teesside and District branch, Polytechnic, Middlesbrough, 19.00.

JANUARY 15-19
Winter projects meeting, SEAS, Brighton. Details from local organiser, 01-432 9312.

JANUARY 16
Design and optimisation of job scheduling systems, L. M. Grant, BCS Group, Aspects of Computing Science (Formal), Polytechnic of Central London, London W1 8 3J.

JANUARY 16
Working parties' reports, Association of Project Managers, Waldorf Hotel, London WC2 2 7JW. Details from local organiser, 01-432 9312.

JANUARY 16
Microprocessors and profitability, Microprocessor Application Group, I.E.S. Savoy Place, London WC2 2 7JW.

JANUARY 16
An update on planning systems from ICS's point of view, Peter Cook, BCS Urban Planning group, Lams, 3 Buckingham Gate, London SW1 1 4JW. Please notify 01 224 210, ext. 24.

JANUARY 16
Viewdata systems, BCS Kingston branch, Kingston Management Centre, New Malden, Surrey, 19.30.

JANUARY 16
Shaw, chairman of ICS branches, BCS Hampshire branch, The Tabby Cat, Chichester, 19.00.

JANUARY 16-17
"Data management group, Mount Royal Hotel, London, 14.00.

JANUARY 17
Planning for automation, Tony Benn, Barry Sherman, Dr David Eversley, Polytechnic of the South Bank, London SW8 5 1J.

JANUARY 17
User forums for communication systems, collocation, I.E.S. Savoy Place, London WC2 2 7JW. Register 01-240 1871, ext. 26.

Edited by Nancy Pocock



CMC offers work experience

COMPUTER Machinery Company is helping in a Work Experience scheme at its Hemel Hempstead plant. Many local schoolchildren have already spent a week there gaining experience of industry and electronic assembly. The scheme has been organised by the careers office of Dacorum Council, and invites schools and firms in the Hemel Hempstead area to cooperate in giving children in their final year at school experience of working in industry. Seen in our picture is 15-year-old Desmond Fernandes being shown the intricacies of the printed circuit board by senior chargehand Paul Bolt.

John Neaves, until recently sales director of Scan Computers, has been appointed managing director of the company, which is the minicomputer turnkey subsidiary of Scan Data International.

Jim Machin has been appointed hardware development manager for Computer Machinery Company. He was previously chief engineer with Computing Devices of Hastings, a subsidiary of Control Data.

David Eacott has been appointed senior recruitment consultant for Computer People North. He was previously a sales manager for the northern area with Kolor Continous. Bernard Gibbons becomes a recruitment consultant, joining the

company from ICL, where he was a support manager. Jane Byrne, formerly a personnel officer with BOC, has been appointed personnel coordinator in the recruitment division of CPN.

From Pitney Bowes, where he was a salesman, Brian Hunter has joined CoOperators, where he will be a sales executive. Alan Hutchinson joins CPN as a sales executive in the contract systems and programming division. He was formerly a salesman with a mail order company, and before that with Olivetti, CPN and CoOperators are part of the VLI Group.

Richard Moore has been appointed UK sales manager for UCSL Microsystems.

OP SPOT

By Bernard Allen

DP management and shift work hinder career aims

MEMBERS of the operations fraternity who wish to study with a view to furthering their careers come up against two major problems — shift work and the attitude of DP management.

Working irregular hours means that they are unable to follow courses at night school in order to add to their academic qualifications.

And DP managers are usually reluctant to help pay the costs which might be incurred by taking a correspondence course. Such courses tend to be "rather pricey".

These points are raised by a Staffordshire operator who, in a letter to Op Spot, gives vent to his frustration.

He says, "Apart from disrupting the social life of operations staff, shift work also prevents us from going to night school or following courses by other

means." Criticising DP management for failing to give operators the right help and encouragement, he continues: "DP managers don't seem to mind sending their beloved programmers on courses, or even allowing them to go to college with time off and pay."

"Therefore programmers are able to continue their studies and further their careers, while the operators just have to put up with working shifts."

He mentions that this is just one of the problems faced by operations staff, but stresses that it is a very important subject and should be given further consideration. I echo those sentiments.

I agree that study is important, but consider that operators should use it as a means of building on their technical knowledge rather than gaining further academic qualifications.

If you are ambitious, consider your installation and attempt to become an expert on a subject that particularly interests you. For example, if your site has a large TP network, learn all about it, and if a vacancy arises in that department, apply for it. Use your initiative.

Adopt this attitude, then shift work may be viewed as an advantage rather than a disadvantage, for the evening and night shifts often present free moments which may be used for study.

Get to know the technical manuals in detail. If a problem or query arises, you should know where to look for the answer immediately.

Some installations have magnetic tapes and discs which are dedicated to staff training. Use them to create, copy and delete files, but please do not tamper with live ones.

On the evening and night shifts, run small jobs using the job control language of the system. If the jobs go down, all the better, for you will learn a lot by correcting the errors and rerunning the jobs.

Consider the various commands of the operating system and try to use them in a manner slightly different from the accepted norm at your site.

Above all, ask questions. If you don't understand something about the operating system or one of the applications, find someone who is able to help you. If it means going to the operations manager, do so.

If he can't help you, at least you will have brought to his attention the fact that you are interested and that it's about time he did something about it. Remember that your site isn't the only one in existence — if your manager doesn't appreciate your interest and ability, consider finding an installation with a manager who does.

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MICRO NEWS

Edited by Martin Banks

PA International to help with government's micro awareness programme

THE UK government is now moving into gear in its push to promote not only the application of the micro, but also a much greater awareness of its capabilities in general industry. The appointment of management consultants PA International to help the Department of Industry organise its awareness programme (CW, December 21/28, 1978) is now taking government action beyond the provision of financial resources alone.

PA's objectives are to secure a full understanding among industrial decision makers and trade unions of the pace of the technology and the breadth of its applications in product design and in production methods. Its first task will be to outline for the Department, by January 26, the overall plan of campaign to meet these objectives.

It will be working within the framework set out by the Department at the introduction of the Microprocessor Applications Project, which included a commitment of some £10 million to promote awareness of the new technology in industry.

Both the Department and PA are well aware that the job ahead will be an uphill task. As PA director Ken Simpson put it, "There is an intellectual credibility gap to be overcome. It will be a case of dragging the horse to the water and trying to force it to drink."

The "water" in this case will be a nationwide series of seminars. To reach the 50,000 executives the Prime Minister has targeted for this programme will require seminars to be run in some 50 cities, once a week for 30 weeks, with 30 delegates at

each seminar. At first, the seminars will be of a general nature, but they will probably be followed by more specialised seminars, possibly dealing with the specific problems of individual industrial sectors.

It is also possible that, to overcome the natural reluctance of many British managers to encompass something new within their thinking, other media such as radio and TV will have to be employed.

PA executives are well aware that there is bound to be a hard core of industrialists that will refuse to be involved without considerable persuasion. The DoI realises that this is

most important in the mechanical engineering sector. Though this contributes some 28% of the UK's manufacturing wealth, all the signs currently point to a considerable lack of understanding and/or interest in applying new technology.

For example, under the MAPCON project support scheme there have been some 150 proposals submitted for funding approval, but only 20 of these have come from the mechanical engineering sector of industry.

According to PA International estimates, the total funding committed to supporting microelectronics and its applications with EEC countries now totals £1,000 million.



Kim 1, the small single board microcomputer system from Commodore (seen here with some of the many add-on boards that are now available for it) has been reduced in price to under £100. Now £89.95, the 6502 processor based system incorporates in its basic form the CPU chip, 2K bytes of ROM and 1K byte of RAM. Input is achieved using a hexadecimal keyboard, and data readout is from a hex display.

Manual of microcomputers

JOINING the growing ranks of "books worth the read" for information about the microprocessor and microcomputer is a new publication from Mackintosh Consultants, publishers of monthly newsletter Microcomputer Analysis.

The book is called 'Manual of Microcomputers' and it is the first time the company has produced a classified index of what has appeared in the newsletter. It is somewhat more than that, however, for not only does it list

information from the newsletter, but reprints it by subject area, thus pulling together in one place a considerable amount of data on related subjects.

These range from discussions on the relative merits of various microcomputer architectures and process technologies, through comparative analyses of different processors and board systems, together with the various types of storage technology and high level languages available.

Microcomputer Analysis was edited and written by Iann Barron.

In his introduction to the Manual, he underlines the importance of being aware of the future potential of microcomputers when he says, "It creates a new type of building brick, which in due course will eliminate the need for conventional programming skills, replacing them by a formalised design process expressed in a high level language. When this happens (10 years?) the microcomputer will have achieved the capability to become a truly pervasive component."

Manual of Microcomputers, 306pp, is priced £80.

Keyboard kit for £27.50

A NEW keyboard kit for as little as £27.50 is now being offered by the Newbauer Computing Store. Available at this price in unencoded form, the keyboard requires only the addition of a 5 volt power supply.

The 83-key board is switch selectable between upper and lower case, and upper case has only ASCII characters. All inputs and outputs are TTL compatible and follow normal 7400 series loading and level requirements. Parallel output is standard.

The price for the complete kit in encoded form is £85.

PO puts in service first telex exchange with stored program control

Personal status

IT had to happen sooner or later — someone would consider that a TV was too insignificant as a status symbol for the motor car. To be one-up now, it's a personal computer or nothing.

Parthasarathy, maker of what has been called the most prestigious car in the world, the Panther De Ville saloon, has fitted a Commodore Pat in place of the rear seat television, so that its elite band of customers (including such well-dropped names as Sir Taylor and Oliver Reed) can play lunar lander or run business programs to while away the tedium of traffic jams.

The story of how, why, where and when all this was done can be found in this month's issue of hobbyist magazine Practical Computing.

Belle program triumphs over Chess 4.7 and others

AT the end of last year, the annual ACM Computer Chess Championship in Washington, DC, saw the overthrow of North-western University's 4.7 Chess program, the current IFIP world title holder.

The victorious program, Belle, was developed by Kenneth Thompson of Bell Laboratories. It ran on a Digital Equipment PDP-11/70 with a custom-built microelectronic front end. Chess 4.7, written by David Slate and Larry Atkin, was mounted on its accustomed CDC Cyber 178 which processes approximately 15 million instructions per second.

Play of the 12 entrants to this Swiss-style tournament ranged from "Class B" to "expert". Belle had four outright wins, against Chess 4.7, Chaos (Amdahl 470/V6), Blitz (Univac 1110) and the British program Mike running on a Motorola 6800.

Chess 4.7 was runner-up followed by a three-way tie among Chaos, Blitz and Sargon (running on a Zilog 80 microcomputer). Duke University's Duchess (IBM 370/108), which shared second place with the Moscow program Kalsin in last year's IFIP World Championship, trailed in sixth place.

The new order is for a 46 model 90 due to be operational in 1981 in Keybridge House, also London, on the south side of the river. It will initially handle 11,000 lines, building up to 25,000, in line with 170 countries. It will be able to switch 360,000 calls per hour, against the model 70's 72,000, have hunched store and forward facilities, need fewer tapes to statistics, consume half power and have improved maintenance facilities.

It is claimed to be the largest and most sophisticated change of its type in the world.

DB/DC: What a difference a day makes

More and more d.p. installations are turning to an integrated DB/DC approach to provide a more effective systems service. Implementation delays, inflexible systems with a high maintenance overhead and problems in servicing management enquiries have been a headache long enough. Whereas eight years ago it was seen as a bold step to go data base, now working and proven data base management systems and L.P. monitors make the move realistic.

Nevertheless with the wide variety of software packages on the market and the continuing development of data analysis techniques, d.p. management are confronted with a complex array of options. Selection of a data base management system, particularly when used in conjunction with data communications, is a true, is no simple task. Rather it is all too easy to select the most convenient at the time or to take a lucky dip into the software package bran tub. The level of resource investment — intellectual and hardware — demanded by a software package

after acquisition has to be borne in mind. So it is important to be aware of the detailed facilities provided by available DB/DC systems.

To this end and to demonstrate the improvements in productivity, staff motivation and user satisfaction, and the more effective use of computer resources achievable by high quality DB/DC systems, Adabas Software Limited has arranged regular seminars on its comprehensive product range for IBM 360/370 and IBM compatible computers.

ADABAS — the Adaptable Data Base System which, as confirmed by the 1977 Datapro survey, is efficient, flexible and powerful supporting systems too: ADABAS Data Dictionary, ADAMINT — a data manipulation language, ADASCRIP — an online query language, ADACOM — a comprehensive batch retrieval system, and ADABOMP — a bills of material management system.

Natural — is an on-line and batch communication language for use with ADABAS and non-ADABAS files, enabling application programs to be completed in a small fraction of the time normally required.

Com-plete — is a unique t.p. system which combines all teleprocessing functions in one reliable high performance package: transaction processing, RJE, interactive program development, message switching, interactive utilities and much more.

Seminars on ADABAS and Com-plete, each one day, will be held in London on 30 January and 31 January 1979 respectively and in Edinburgh on 28 February and 1 March respectively.

You are invited to spend a day (or two) with ASL and see what a difference a day makes to your understanding of ASL's DB/DC systems!

E. C. Hutchinson, Adabas Software Ltd., Laurie House, 22 Colyear Street, Derby DE1 1LA. Tel: 0332 372537

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A White House report on technology transfer was presented to Congress last year (CW, September 14). HESH WIENER presents a condensation of the report, with particular emphasis on its implications for national security.

THE most interesting technologies discussed in the White House report on technology transfer sent to the US Congress (Guest Computerview, September 14), are those which have significant national security implications rather than those which deal with agriculture, health, or education.

Technology transfer can be defined as the act of conveying know-how from one country to another. The means may involve the export of technical data, equipment, and processes. The effectiveness of technology transfer depends not only on what is transferred, and how, but also on the capacity of the receiving country to absorb it and put it to work.

The term "technology transfer" is also frequently employed in a broader sense to refer to the export of products (end-items) embodying particular technologies.

Given the extent and complexity of the controls which

White House view of technology transfer

have been established and the need for effort to improve their effectiveness, an ad hoc National Security Council (NSC) Technology Transfer Group has been established to co-ordinate implementation of planned improvements in the export control system. The group will include representatives of the major agencies interested.

There are four general ways in which civil technology transfers (that is, transfers for civil purposes) might contribute to the military potential of the receiving country. Firstly, where the technology is embodied in a product which has potential military application, it is possible that the product might be diverted from an intended civil use to some military use.

Secondly, know-how might be transferred to produce products, such as electronic components, for the civil sector of another

country. These products might in turn be applied to military as well as civil uses.

Thirdly, know-how supplied for civil purposes might be diffused from the civil sector to the military.

Finally, it is sometimes argued that if imported technology has a resource-releasing effect (through more efficient use of resources), resources released from the civil sector might be redeployed in support of military programmes.

Certainly, in the US, much technology is in the public domain, and there is very little the government can do (even if it wished to) about controlling the flow of information, through technical and trade journals, for example, technology in the public domain is not the most advanced technology, except in such fields as agriculture, health, education, and con-

struction.

Much technology of potential military interest is proprietary. The concern controlling the technology may, therefore, have a stake in protecting it.

Government control is not, therefore, synonymous with government ownership. In addition to having the authority to control exports, the government can impose security classification.

In the case of Nato, sharing advanced weapons technology strengthens the common defence. One of the most common forms of the transfer of weapons-related technology among allies is the licensed manufacture or co-production of advanced weapons systems and components. Data transfers and co-operative research and development are also used.

In the case of both weapons-related and dual-use technologies, it should not be assumed

that trying to retain specific technologies in the US would ensure technological superiority. Such effort alone might be counterproductive.

The temptation to rely on existing technology, coupled with decreased government research and development funding, might lead to a slowing of effort directed toward the research, development, and continuing technological innovation that are essential to continued US technological superiority. It is under such circumstances (rather than as a result of the transfer of technology abroad) that loss of US technological superiority might occur.

There is very little hard evidence that technical data of US origin has leaked to the East through Third World countries. Controls are imposed on re-transfers or re-exports. Most cases of diversion of US know-how to the East involve third industries in one way or another. However, the number of proven cases of such diversions is quite limited. Other industrialised Nato countries and Japan co-operate with the US in CoCom to co-ordinate controls on the export of strategic products and technologies.

Non-aligned Western countries of course do not participate in CoCom. For their own reasons, however, they too control certain exports. The Soviet Union has been willing to sell sophisticated weapons to almost any developing country, has accepted somewhat lower prices than those for comparable Western equipment, and has been able to make fast deliveries.

The US and the Soviet Union have initiated talks concerning restraints on conventional arms transfers. The US recognises the proliferation dangers inherent in the spread of certain sensitive technologies (uranium enrichment, reprocessing, and heavy water production) and has maintained a policy of not authorising the export of such facilities and of urging other supplier nations to exercise similar restraints.

Intergovernmental programmes of scientific and technical co-operation are not yet carried on by the US and the People's Republic of China. A small number of government-facilitated exchanges takes place each year involving a wide range of scientific, technical, and social fields. These exchanges are of short duration and are primarily directed toward basic research. They are not considered to have any significant impact on China's military potential.

The US and Soviet Union are currently engaged in co-operative scientific and technical efforts under 11 bilateral agreements. The activities under those agreements generally involve exchange of information and experience and basic — and sometimes applied — research. Although the Soviets in some areas have sought activities more directly related to production technology, they have accepted US insistence, and sometimes insisted themselves, on more basic research efforts.

The controls exercised by the US and other members of CoCom are designed to withhold militarily significant uses; the review process necessarily seeks to determine whether legitimate civil uses can be accommodated without significant military risks. Much discussion of export control issues has centred around exports of computers, for which there are many bona

fide civil uses. Computers and computer peripherals account for more than half the total of CoCom-approved exceptions.

Where such exceptions are made, however, it is because the circumstances or conditions of the export make clear that the exports would not have adverse military implications.

Close and effective cooperation among the US and other major nuclear supplier states has been developed in the Nuclear Suppliers Group, whose major effort thus far has been development of guidelines for the transfer of nuclear technology and materials.

In general, the US offers only limited incentives for the transfer of technology abroad. In the case of the Export/Import Bank, most of the exports supported by the bank are capital goods and thus to a degree entail the transfer of technology.

However, it is not appropriate to characterise the bank's programs as "incentives" to transfer technology abroad. Rather, the bank's activities are



Carter... Congress is asked, "Why should our exporters be denied profitable sales opportunities not denied to our competitors in other countries?"

relevant to the question of who will export the capital goods in question (the US or a competing industrialised country). A recent study by the Treasury Department indicates that in the bank's direct loan programme, in 64% of the cases, the export would not have taken place without the loan. It is reasonable to assume that in a number of these cases, the business might well have gone to another country.

Existing legislation and regulations provide an adequate basis for the identification of strategic technology to ensure that national security implications are properly considered. This legislative authority has been translated into effective regulations which are reviewed and modified periodically, particularly as they relate to adding and deleting specific items from controls.

In the case of dual-use items and technologies, with extensive civil applications, controls may be desirable for items and technologies having particularly significant military applications. However, the case for unilateral national action is weak. Most technology is so widely diffused in the industrialised countries that unilateral controls would be ineffective.

Exports of items for apparent civil use are considered part of normal trade, with far less political and military significance than exports of arms. In the absence of international agreement on export controls, the question is raised as to why our exporters should be denied profitable sales opportunities not denied to their competitors in other countries.

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<p>DATABASE</p> <p>The UK and European divisions of a U.S. public Corporation have openings in their London, Zurich and other European offices for Senior Database Administrators, Designers and Applications personnel with extensive database experience using any of the proprietary DBMS currently in use on major mainframe and mini systems. Of particular interest are persons with expertise in IMS, JCL, ADABAS, DBS, RDBS etc. Hardware backgrounds are of little importance — what is essential is the depth of experience in your relevant area of database expertise. Our client is anxious to maintain their prestigious standing world-wide by attracting proven and potential talent.</p> <p>London — £7-10K Europe — £9-16K</p>	<p>PL/1</p> <p>International company requires PL/1 programmers for the following U.K. locations: Central London, Horsham, Herts, Hants, Bucks & Cheshire. Applications are commercial and the hardware is IBM 370/143 and 154 under OS, DOS/VS programmers will also be considered if they are prepared to switch to OS. The client wishes to recruit project leaders, analyst-programmers, senior and junior programmers. 2-7 years PL/1 is required within a commercial environment. Some positions could involve U.K. travel. Salaries will be above average and dependent on experience. Database and on-line applications experience would be considered very advantageous.</p> <p>LONDON: IL COUNTIES SALARIES £6.8-8.5K</p>
<p>MESSAGE SWITCHING</p> <p>If message switching is your forte and you value working at the cutting edge of developments in the switching field such as System X then we have our client's authority to initiate serious negotiations with a view to offering you what can only be described as a superlative career opportunity involving advanced applications in an environment featuring creativity, innovation and design freedom coupled with significant autonomy. These opportunities will ideally suit experienced message switching applicants (2-5 years). Our client specifically requires Senior Analysts, Analyst-Programmers, Systems Designers and Programmers at various levels of seniority.</p> <p>LONDON £6-9K EUROPE £10-15K</p>	<p>IMS</p> <p>An international client with an enviable reputation in the application of IMS (DB/DC) to advanced commercial and technical areas has openings in London, Kuwait, Hampshire and Surrey. Applications programmers should have extensive COBOL or PL/1 experience and have worked under IMS for a minimum of 2 years. You will be given every opportunity to develop your skills within an environment which will encourage you to contribute ideas and expertise and where personal recognition is expressed in tangible terms. You will be expected to shoulder responsibility and motivate team members working under your supervision.</p> <p>LONDON & S.E. £7-9K KUWAIT £12-15K</p>

MYRIAD COMMERCIAL APPLICATIONS SPECIALIST — EIS

EIS is the European Information Systems Department of a major, multi-national manufacturing company with its U.K. headquarters located in Reading. The department is responsible for the production of an interesting range of commercial systems providing essential business information to European national profit-centres with a central reporting function to the European H.Q. An extensive communications network facilitates remote computing and the British company is currently installing a large mainframe. Established in 1957 the organisation has maintained a progressive annual growth rate enabling it to offer exceptional career progression to professional staff.

This is a first-class opportunity for the successful candidate to apply and gain valuable experience in an expanding organisation and provides outstanding scope for rapid career progression. A good commencing salary is offered and full relocation expenses will be reimbursed where appropriate.

Currently an Analyst or Senior Programmer with sound commercial applications experience is required for a key role within the EIS team. The Commercial Applications Specialist will be responsible for project managing the development of a range of international business systems. Following the successful implementation in the U.K., the person appointed will guide and advise other European computer centres in establishing their own in-house business systems facilities. Self-motivation and a high level of communication skills play a vital role since this position requires extensive user contact, the ability to liaise and work closely with all levels of management, and may involve some European travel.

Ref. SW1/0401

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants
Telephone or write to: 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

Management and Information Systems Senior Software Programmer

(Inclusive of London Weighting and Supplement)

£5,313-£7,069

The Sharpey-Schafer Centre is well established in the application of computing and management sciences to health care problems. The Centre undertakes R & D work in the field and also provides a service to St Thomas' Health District.

The central computer is a Honeywell Sigma 6 using 512KB of memory and 40MB of disc. A large number of users are supported on line via VDU's TTY, OMR and laboratory instruments.

The CP-V Operating System supports concurrent time-sharing and batch facilities covering a wide range of work.

A Prime 300 with 756KB of memory and 60MB of disc is used for pathology data processing and is to be linked to the Sigma 6.

Applicants for this key post should have at least two years' experience of maintaining an Operating System and/or in writing complex software.

The successful candidate will join a small team with a reputation for high quality work and be responsible for all aspects of general purpose software, including CPV and Primus. Languages used are COBOL, FORTRAN, CORAL and ALGOL. Development is performed on line.

The hospital has a good system and social facilities. Further details and an application form are obtainable from the Personnel Officer, St Thomas' Hospital, Lambeth Palace Road, London SE1 7EH (phone 928 9292). For technical information phone Adrian Stevens or Steve Ripley on extension 2378.

Sharpey-Schafer Centre

Software Engineer IBM EXPERIENCE

Middlesex / West London

The Data Communications Division of a £3 Billion Corporation operates a small and highly successful company employing about 80 people World Wide. The bulk of the day-to-day sales and support is handled by about 37 distributor companies in over 40 countries.

One of the main functions at this nerve centre is the on-going new product evaluation. The continual process of introducing new product lines to the existing Hardware and Software range stimulates work content and job satisfaction for the people involved.

Plans for 1979 involve the introduction of many new products which will have to be evaluated, tested and supported through distributors. An important new product range incorporates a direct channel interface into IBM. Accordingly for this appointment we need candidates with experience of IBM or IBM compatible equipment. Specifically, we would prefer people with experience of IBM software including access methods (F) Software and interfacing with mainframe environments, although people with similar experience in other mainframes would be considered.

This appointment calls for a highly qualified individual who has the strength and ability to evaluate market trends, organise training facilities and to take responsibility for his own specialised area. Long-term opportunities exist for movement and growth within this tight knit organisation.

CW/1/10

Software Programmers

Reading £5000-£9500

A Major International Software House requires programmers with a minimum of two years' ASSEMBLER level programming on any manufacturer's equipment and who are familiar with the techniques of writing software.

This is your chance to join a team engaged in the design and coding of major communications systems software for ICL's 2900 series under the VME supervisors.

You will be paid a competitive salary, up to the top of the indicated range if you can also demonstrate specialist knowledge in one or more of the following:

- SSL Coding
- S3 Coding
- Language Design
- Compiler Design
- TP Monitors
- VME: F
- VME: B

Natural ability and professionalism are more important than experience as full training will be given where necessary.

CW/1/13

Systems Consultants

New Product Range Continental Europe Up to £15000

Our client is one of the world's pre-eminent systems software companies. In co-operation with several of Europe's leading computer manufacturers they are working in the planning and design of new systems based on both mainframe and minicomputers.

For one major manufacturer they are setting up a central software planning department whose task is to define and design a range of systems software capable of sustaining a new range of minicomputer products in a market sector orientated towards distributed systems, networks and on-line interactive commercial applications.

Additional Senior Consultants are required (minimum ten years' experience) with outstanding knowledge in the areas of real-time systems, operating systems and data base design.

CW/1/16

Programmers / Designers

Reading £4500-£6250

One of the largest independent Systems Houses who have offices throughout the United Kingdom and Western Europe, have an urgent need for PROGRAMMERS/DESIGNERS for their READING office.

Their clients range from computer manufacturers, nationalised industries, process control equipment manufacturers, through to small local businesses. With such a wide client base they are able to offer varied experience and careers leading to areas such as Project Management, Management Consultancy, Systems Analysis and Design.

The range of minis and micros on which they work is only exceeded by the variety of backgrounds and experience they are prepared to consider applicants from. Experience on the following Hardware would be of special interest: 2903, B80s, Datapoint 2200 & 5500, PDP-8, 10 and 11, B800s, Zilog, Intel, Motorola and Texas micros.

Openings exist in their Small Business Systems, Industrial and Process Control and Basic Software Groups. Applicants should have at least 18 months' experience, and be interested in progressing into other areas of computing.

CW/1/11

Opportunities in Europe for 1979

Attractive Salaries:

- | | |
|---------------------------------------|-----------------|
| 1. CAD/CAM — Mechanical Eng. | HOLLAND |
| 2. Technical Analyst / Mini Software | HOLLAND |
| 3. Siemens 330 Software | GERMANY |
| 4. IMS Systems Programmers | GERMANY |
| 5. Production Control Analyst | GERMANY |
| 6. 32-Bit Machine Software | SWITZERLAND |
| 7. IBM Systems Engineer | FRANCE |
| 8. Network Designers Mainframe / Mini | SOUTHERN EUROPE |
| 9. Real-time Consultants | HOLLAND |

Candidates interested in a move to the Continent with the above or similar experience, should contact us to discuss these opportunities.

CW/1/14

European Advisor

On-Line Business Systems London £8000-£10000

A major UK systems company is developing on-line commercial systems for installation in a number of European locations.

They require a senior consultant to assist the end-user — an American multi-national organization — by analysing his requirements in each country and planning for the installation of each system. In a second phase, local systems will be linked to a central IBM bureau forming a European-wide distributed processing network.

Candidates must have a sound knowledge of on-line commercial applications; an appreciation of the potential advantages and limitations of minicomputers and the personal ability to work effectively with management and staff of varying levels and nationalities.

The UK systems company is part of European systems group and offers attractive benefits plus excellent opportunities for career development.

CW/1/17

Sprechen-Sei Deutsch?

Minis/Mainframes up to £17500

One of the most prestigious software companies in Europe is currently expanding their German operations in Central Germany. Their business is based on a wide range of projects currently being developed on both Minis and Mainframes.

Due to this planned expansion, they want to meet several computer professionals who are competent in German. Technical background can be spread but current priorities call for experience of system 370, 34, Nixdorf, PDP-11, Nova, Siemens 330 and the internals of IBM operation systems.

While our client can accommodate people seeking employment for a year or so, they definitely want candidates with medium to long ideas about settling in Germany and building a career within the firm. Although they require specialists in the above skills they are also very interested in recruiting Junior people with circa two years' experience to develop their careers.

CW/1/12

Analysts & Programmers

London to £7000 + Car Scheme

An exciting opportunity has developed for ambitious Analysts and Programmers to join a medium size, expanding computer company involved in automobiles and finance industries.

Our client's computer operations are based on NCR CENTURY 75, which will be upgraded in April, 1979, to a 75-70. Development is in progress on an interactive on-line communications system using audio response equipment on a nationwide basis.

They would like to hear from Analysts with a Programming background and have had some proven systems experience. It is unlikely you will have had less than five years in the D.P. industry. Also we would like to hear from N.C.R. trained Programmers who have had between 1-5 years' experience.

Continual company growth based on the development of external customers' systems, guarantees excellent prospects for suitable employees who are prepared to work hard.

CW/1/15

Distribution Designers

Multi-million Pound Development Southern Europe £8000-£12000

Our client is an international systems company engaged in specifying and designing a nationwide computing network for a distribution organization. The end result will comprise a wide range of on-line and batch applications operating on a network of up to fifty mainframe and minicomputers.

They require analyst/designers with experience in any of the following:

- on-line minicomputer systems
- applications for order entry and inventory control
- communications
- hardware/software integration

The project offers the opportunity for short or long-term assignments based in a capital city of Southern Europe. Remuneration, benefits and allowances are commensurate with the scope and importance of the project.

CW/1/18

SYSTEMS CONSULTANTS — SYSTEMS ENGINEERS

CHOOSE GERMANY SALARIES TO DM 90,000

Are you looking for?:

- A new challenge in sales support.
- Real career development.
- Exciting new products.
- International travel.
- High earnings and large company benefits.
- Extensive training (including German language).

We are looking for experienced systems people to spearhead our attack on the medium-to-large systems market with our revolutionary new products.

You will probably have some three years' experience with medium/large IBM, ICL, Univac, Honeywell Systems. A good knowledge of Assembler and Cobol, DOS/VS — VM/370 or equivalent. A knowledge of PL1 or RPG-II would be an advantage.

After formal product training you may choose to work in MUNICH-FRANKFURT-DUSSELDORF or HAMBURG and a full German language course will be provided.

ACTION — Phone or write quoting reference DS-2 for an informed discussion and an interview in London.



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Central Computing Consultants

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212 Telex 27950
DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 789577 (5 Lines)

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CONTRACT DIVISION

MIDLANDS & N. ENGLAND

IBM
SYSTEMS DESIGNER OS PL/1 COBOL 1900 PLAN. MIDLANDS c. £250
ANALYST/DESIGNER IMS. NORTH WEST c. £250
CICS PL/1 DL/1 CONSULTANT. MIDLANDS c. £250
IMS PL/1 PROGRAMMER. MIDLANDS c. £230
IMS COBOL PROGRAMMERS. MIDLANDS c. £230
COBOL PROGRAMMERS. MIDLANDS, NORTHWEST c. £220
ICL
2903 ANALYST/PROGRAMMER. NORTH WEST c. £230
2903 PROGRAMMERS. NORTH c. £220
1900 COBOL GH/III PROGRAMMER. MIDLANDS, NORTH WEST c. £215
2960/70 VMEB/MEK COBOL PROGRAMMERS. NORTH c. £220
2960/70 VMEB/MEK FORTRAN PROGRAMMERS. NORTHWEST c. £220
OTHERS
PDP11 TECHNICAL SPECIALISTS. MIDLANDS c. £250
SYSTEMS DESIGNER SRSX11M RTL2 BASIC + 2. MIDLANDS c. £250
PDP11 BASIC + 2 PROGRAMMERS. MIDLANDS c. £230
HONEYWELL COBOL PROGRAMMERS. NORTH MIDLANDS, SCOTLAND c. £220
IDS/TDS SOFTWARE SPECIALIST. NORTHWEST c. £250
UNIVAC COBOL PROGRAMMERS. MIDLANDS, NORTH WEST c. £220

Ring: Perry Butler or Judy Leas
061-833 9341/5
143/144 Royal Exchange, Manchester

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- ★ High remuneration assured throughout the year
- ★ Security of employment from continuity of work
- ★ Career development from learning new DP techniques
- ★ Overseas opportunities
- ★ Financial advice in all matters of taxation, mortgages, pensions

LONDON & HOME COUNTIES

£200 ICL 1900 COBOL GH
£220 ICL 1900 COBOL TPS EXP
£200 ICL 2903 TPS EXP
£220 ICL 1900 PLAN + COBOL
£220 IBM PL/I OS
£200 + IBM COBOL DOS VS
£220 IBM PL/I UNIPAY EXP

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CITY
ESSEX
HERTS
BERKS
W. END
CITY

£240 IMS DB/DC PROG/ANALYST
£200 UNIVAC 1100
£230 PDP MACRO II RSXIIIM
£240 MINI ASSEMBLER PROCESS CONTROL
£230 PDP MACRO II + CORAL
£260 TEAM LEADER BASIC COMPILER
£230 CORAL/ALGOL/FORTRAN COMPILER

BEDS
ESSEX
CITY
SURREY
HERTS
HERTS
HERTS

OVERSEAS

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£ EXEC RATE
£450 p.w.

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£375 p.w.
£375 p.w.
£425 p.w.
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PDP FORTRAN KN OF FRENCH
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PDP MACROII RSXIIIM
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Ring Christine Kay/Dave Hayton, 734 0152/6 (24 hrs)

As a successful international recruitment and contract organisation we have considerable experience in assisting companies in industry and commerce throughout the UK and Europe, call your nearest K.P.S.L. office and discuss the many opportunities available to you.

KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON, W.1 TELEPHONE 01-734 0152/6 (24 HOURS)
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM



AREA DEVELOPMENT MANAGER SURREY

Our client is an international manufacturing company with associate companies throughout Europe. They require IBM 7245 under both DOS VS and CICS VS with an international telecommunications network for voice, message and data linking the UK, Holland and U.S.A. The successful candidate will have responsibility for both UK and Dutch operations, provide effective facilities for information services and management of local computer network. Part of role will be evaluation and advice on new hardware in conformity with current hardware technology and related telecommunications equipment.

- Excellent career prospects
- Subsidised restaurant sports and social club
- Location: rural and pleasant park grounds
- Relocation expenses REF 1925

EDP AUDIT LONDON

Our client, a British based hardware manufacturer, is currently extending applications both in UK and overseas. A highly motivated professional is needed to undertake formal audits of accounting systems, reviews of all projects and development, participating in the cycle of systems development from project initiation through to final running and formal support. Also EDP audit technical proposals for pricing systems and assistance to help authorities. Ideal applicant will have experience in IBM and preferably PDP on hardware and use of audit control program and of programming knowledge (COBOL or BASIC) + Co. offers

- Subsidised restaurant
- Travel expenses
- Non-contributory pension scheme
- Unusual scope for career development REF 1906

SENIOR SYSTEMS ANALYST LONDON

Excellent opportunity exists for a senior systems analyst to work within an international company providing financial information and national systems. Ideal candidate will have a good knowledge of IBM background in a hardware or financial company and a proven record of experience in developing and maintaining major systems of this type. If you want to work in a challenging and stimulating environment of a major financial institution, please apply.

- Friendly atmosphere
- Access to leisure facilities
- Non-contributory life assurance
- Pension schemes
- Top salary REF 1958

PROJECT LEADER LONDON

With turnover of £20m our client, a major group of companies, has business interests in the UK and overseas specialising in the provision of a wide range of products and services to various professions. Retaining PDP mini they seek person with a good programming background and at least 12 months as a project leader with one project handled from design to implementation. This is a responsible position for someone who wants to enhance their career development. Co. offers

- Opportunities for promotion to manager with a company car
- Working on a wide range of applications including micros, minis and mainframes REF 1967

ANALYST PROGRAMMER LONDON

Enhance your career, this is a fantastic opportunity to progress in major oil company. If you have good IBM experience in programming in COBOL and ASSEMBLER or MARK IV and at least 2 years as an Analyst Programmer apply NOW. Position involves working on financial and commercial applications and to become involved with database systems. Thus IMS would be an advantage. Co. offers

- Regular salary reviews
- Excellent career prospects
- Easy access from south close to major rail station REF 1983

SYSTEMS ANALYSTS SURREY

Management can be yours! Have you the ability to make practical contributions to business decisions, communicate effectively at all levels and at least 2 years IBM systems and systems experience? If so our client, part of a large insurance and financial conglomerate, would like to discuss your future. Rapid career progression and excellent client liaison. Co. offers

- Free life assurance
- Free BUPA
- Sports and social club
- Subsidised staff restaurant and luncheon vouchers
- Regular salary reviews REF 1909

TEAM LEADER CITY

Unique opportunity exists within this multi-national communications company. Conglomerate Company is currently engaged in the development of major international message switch systems using MACRO ASSEMBLER RS-II and RTLII. Ideal applicants should have 5 years experience in Real Time programming in Macro Assembler and RSX with message switch experience. If you have the experience plus the ability to lead a small team please NOW! Co. offers

- Up date technology
- Regular salary reviews
- Excellent career structure REF 1908

SENIOR PROGRAMMER CITY

Due to expansion this multi-national bank has an opening for a programmer with at least 4 years' ASSEMBLER experience to work on IBM 370 which runs under DOS/VS. This is a very varied position which involves many new and interesting projects related to international finance. If you have the right experience and strong will to succeed then apply NOW! Co. offers

- Subsidised Mortgage
- Loan Scheme
- Annual Bonus
- Non-contributory pension scheme
- Excellent prospects for promotion REF 1986

SENIOR PROGRAMMER MIDOX

Our client, a computer bureau of well-known international manufacturing company, seeks senior programmer to develop and work on various new accounting packages. Ideal applicant will have at least 3 years' programming in COBOL on IBM hardware. This is a superb opportunity to follow career path, they are awaiting delivery of 3033 in March and lots of new development work is planned. Co. offers

- Flexi time
- Continued development in well-planned schedule
- Progressive organisation
- Plenty of room for growth and excellent earning potential REF 1988

PROGRAMMER N. LONDON

Our client is a major prestige organisation providing services to the British banking industry. They retain large ICL 1900/2900 hardware and are currently developing a major 2 time communication system. Applicants should have at least 3 years' ICL COBOL experience and will be trained on new techniques in teleprocessing. Co. offers

- MORTGAGE SUBSIDY
- Relocation expenses
- Non-contributory pension scheme
- Personal Loan Scheme REF 1988

SYSTEMS ANALYSTS BUCKINGHAMSHIRE

Major manufacturing company has set up new installation in Buckinghamshire and seeks systems analysts to be responsible for various project teams. Hardware consists of 2 ICL 2980's linked to their other installations. This is an excellent opportunity to get involved at the beginning with fantastic career prospects. They will also consider analyst programmers to train in systems analysis. Co. offers

- RELOCATION
- 5 weeks holiday
- Non-contributory pension and sickness schemes
- Excellent career prospects REF 1988

SENIOR PROGRAMMER CITY

As a wholly-owned subsidiary company of one of the largest firms of chartered accountants in the country, our client seeks a programmer for its expanding D.P. dept. With IBM 370 equipment their position is for person with approx. 3 years' IBM COBOL experience and to work on a variety of business packages.

- Opportunity to be involved in the business of a very well established company REF 1951

SENIOR PROGRAMMER N. LONDON

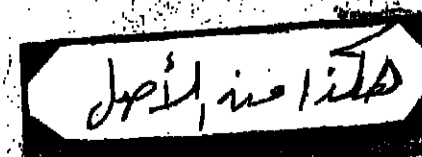
Our client, a major American company engaged in the production and marketing of electronic equipment, is seeking a programmer who has at least 2 years' programming in RPGII. They retain IBM system 3 at present but will consider ICL RPGII experience. Ideal applicant is someone prepared to work in a small team, prepared to accept responsibility, to write programs but also get involved in systems analysis and the general running of the installation. Co. offers

- COMPANY CAR
- Bonus
- Friendly and lively atmosphere REF 1947

KNIGHT PROGRAMMING SUPPORT LIMITED

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DON'T JUST SIT THERE

If you want a well paid job with variety, customer contact and excellent prospects then please get in touch with us.

We are particularly looking for programmer/analysts with a minimum of three years commercial DP experience including COBOL.

You can expect a starting salary in the £6K to £8K range (plus excellent benefits) depending upon experience. We would expect you to develop rapidly and be earning £20K+ in five years time.

If you don't already live in London we do provide relocation assistance.

This is your opportunity to start a professional career with one of Europe's leading computer service companies.

Please write or telephone for more details - you will not be wasting either your time or ours. If you prefer to call me in the evening or at the weekend you may do so on Haywards Heath (0444) 53100

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OPERATIONS CONTROLLER SHIFT LEADER

FOR 2.75 Mb 2960

Applicants for the post of Shift Leader should offer experience of the GEORGE 3 or VME/B in return for approximately £5150 to £6800 per annum plus two shift allowances.

Prospective Operations Controller should be highly motivated computer professionals with in-depth GEORGE 3 or VME/B experience, management potential and be good communicators who are extremely practical in their approach to the problems. A salary of £5600 to £6000 is offered.

Both these positions offer good career prospects including in-house and external training courses and carry a number of good company benefits.

For further details please ring Chris Carter on 01-226 1234 x 218 or x 219

OUR JOBS ARE OPEN TO ALL RACES AND BOTH SEXES.

TRESHAM COLLEGE Northamptonshire LECTURER in COMPUTER SCIENCE

Required as soon as possible to teach on the National Computing Centre 'Threshold' course. Some GCE 'O' and 'A' level work is available. Ability to teach COBOL, an advantage. Salary scale £3192 to £5334 per annum, entry point determined by qualifications and experience. Further details and an application form can be obtained from the Principal, Tresham College, Kettering Centre, St. Mary's Road, Kettering. Telephone: Kettering 86363.

GEORGE II OPERATORS

move to
ICL 2960's

in West London
C. £4,300

One of the major UK breweries have recently ordered two ICL 2960's. These will be installed early next year and will replace the current hardware of two ICL 1903T's running under GEORGE 2S.

As one would expect from a major brewery conditions of employment are first class and include:

- ★ start salary of c. £4,300
- ★ excellent restaurant
- ★ ample car parking
- ★ first class career opportunities
- ★ FREE BEER of course!

Three operators with upwards of one year's operating experience on ICL 1900 mainframes, running under GEORGE 2, are required to complete the existing operations team. Three shifts are worked and with the arrival of the 2960's in the near future, prospects for career advancement are excellent.

For further information (including a data sheet describing our clients installation) contact our CROYDON office quoting ref: CW 53-9S.

COMPUTER AND PERSONNEL CONSULTANTS **CAPP ASSOCIATES** Computing Services Association
10 PARK STREET, CROYDON CR9 1TN 01 686 9693

D. P. Manager

North East Kent, to £8,000

A major British company involved in the important field of transmission and distribution of electrical energy requires a manager to assume full control of the DP installation at its N.E. Kent manufacturing site. The key priorities of this new appointment are reviewing all current applications, personal involvement in the development of new systems and advising on updating of

existing hardware. The successful candidate must be familiar with the DP requirements of a manufacturing organisation. He or she must be able to demonstrate sound technical ability in the areas of systems design, and COBOL programming and have had previous management / supervisory experience. This position offers a comprehensive employment package together with excellent career prospects.

E. Sutton, Ref: 17047/CW.

Male or female candidates should telephone in confidence for a Personal History Form to:
LONDON: 01-734 6852, Sutherland House, 5/6 Argyll Street, W1E 6EZ.

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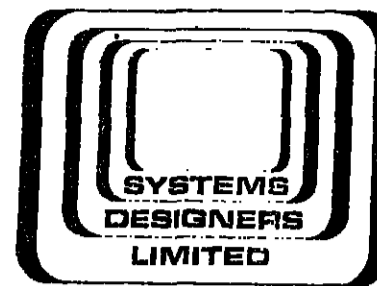
HERTS AND

NORTH LONDON

We specialise in D.P. recruitment in the Herts/N. London area and the following vacancies are a selection from our current register.

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| HEMEL
HEMPSTEAD | IBM Cobol Prog. 12/18 months' exp. Small department. £5000. |
| HARROW | S.S.A. Normal commercial experience. £7000/£8000. Anal./Prog. £6000+. |
| EDGWARE | S.S.A. up to £6800.
Sen. Prog. IBM or Univac, up to £6800.
Operators. IBM or Univac, up to £4500. |
| WATFORD | Sen. Progs. Any Cobol 3/4 years. c. £6000+. |
| LUTON | Syst. Prog. PL/1 and Assembler. £7000/£7500.
Anal. Prog. PL/1 or IBM Cobol. c. £6000.
Sen. Prog. PL/1 or IBM Cobol. £5500/£6000.
Jun. Prog. 6 months' PL/1 or IBM Cobol. |
| POTTERS BAR | Prog. or Prog. Anal. min. 1 year any Cobol, up to £5500. |
| ENFIELD | Prog. or Prog. Anal. min. 18 months any Cobol, up to £5500. |
| ENFIELD | Experienced ICL Operator, c. £4000. |
| WEMBLEY | PL/1 or IBM Cobol Progs. £8000+. |
| BARNET | Cobol Prog. to learn PL/1, 18 months + exp. Up to £5500.
Non-contributory pension. |
| MARYLEBONE | S.A., 2 yrs. IBM background for financial projects. £7000/£8000. |

For more information ring:
HAYMARKET COMPUTING LTD.
Tel: Cuffley (Herts) 4130
up to 6.30 p.m.



Programmers & systems engineers in Manchester: up to £6,500

Systems Designers Limited is an independent British systems consultancy, backed by the NEB, and with an unrivalled reputation in mini and micro computer applications. Established in 1968 and currently 150 strong, the company is expanding its operations in both the UK and abroad. A full order book and continued demands for our high quality services have produced an immediate requirement for a number of professional programmers and systems engineers for our Manchester office.

Current projects are challenging and rewarding and the company policy of full participation of all members offers broad prospects and opportunities for rapid progress for top people.

Requirements exist for people with broad experience in the design and implementation of mini and micro computer systems using both assembler and high level languages. We are interested in hearing from programmers and engineers with at least two years' experience. Applicants must have good academic qualifications and a proven software ability, together with a professional outlook.

Please write to or telephone: Mike Gray at
Elm House, Woodlands Road, Altrincham
Cheshire WA14 1TH
Telephone: (061) 923 9105

TRAVEL INDUSTRY

A highly personalised British company specialising in the development and provision of turnkey systems for the travel industry is expanding to new premises at Maidenhead, Berkshire and has several vacancies for professional staff.

PROJECT LEADERS SYSTEM DESIGNERS PROGRAMMERS

The Company has vacancies for three project leaders and six system designers / programmers to design and implement three major systems. Applicants should be experienced in the design and development of real time systems. Project leaders should in addition have demonstrated an ability to define and document programming requirements for more junior staff. Experience of PDP 11 software or CORAL 66 would be an advantage. Salaries of up to £7000 plus usual benefits are offered for these posts.

ENGINEERS

The Company has vacancies for three engineers to help to set up and lead system commissioning and field service teams. Applicants should have appropriate computer or electronic engineering qualifications and at least five years experience of management for these functions for mini-processor and computer terminal systems. Salaries of up to £6500 plus usual benefits are offered for these posts.

For further details of the Company, job specifications and application forms please telephone 0494 39186.

Handwritten note: Please call 0494 39186



Data Processing Recruitment Consultants

Teleprocessing and Database Scandinavia + London

Salaries: c.£16K

One of the World's foremost Software Specialist Groups having its H.Q. on the East coast of the States has requested Logistix to identify top calibre Teleprocessing and Database Applications and Systems/Software Personnel up to PROJECT MANAGER level and beyond for both career positions and one year contracts in Sweden and London (and possibly in mid-1979 for Switzerland). Suitable applicants must demonstrate real knowledge of current IMS (both DB and DCI) releases in either an Applications or Software realm allied to current or very recent COBOL, PL/1 or B/L programming involvement. It is anticipated that all

candidates will have worked with IMS applications for two years or longer. Applications areas include on-line enquiry systems, banking, sales ordering, stock/inventory control budgeting and forecasting. The scope of projects and the prestige of working with this acclaimed Market Leader will be certain to appeal to the most demanding career minded individuals. The high salaries reflect the prominence which our Client places on the acquisition of these key personnel who are certain to rise rapidly to Consultancy or Management levels should the individual desire.

Systems Development (Pre and Post Sales) Central London & Thames Valley

Salary: to £10K + car

Two divisions of a prestige Systems and Software Development Group are seeking additional personnel at all levels of experience. Generally speaking applicants should have experience in one or more of the following application areas:
COMMERCIAL — equipment selection and implementation, organisational reviews and systems development plans.
TECHNICAL — compiler design, operating systems and communications software. In both divisions you will be given opportunities to act in a pre or post

sales environment. The company offers an outstanding portfolio of company benefits including a minimum of 4 weeks holiday allowance, Group medical insurance and life assurance are already in operation whilst more senior staff are eligible for an annual bonus (currently assessed at 10% of salary). Full removal assistance is available where appropriate. Local interviews in Greater Manchester, Central London and Reading will be arranged to suit requirements.

Data Transmission & Networking Copenhagen

Salaries: to £15K

We have several outstanding permanent career vacancies for Scandinavia's foremost hardware and Software Systems supplier. Particular machine experience is not essential but those who have an in-depth knowledge in message/telex switching and packet switching, data communications and protocol procedures will prove invaluable to the growth pattern this company wishes to achieve in 1979. Of special interest will be PROGRAMMERS and

SYSTEMS DESIGNERS with very recent or current knowledge of the following:
(a) Mini Computers: (i) DEC PDP 11 and VAX
(ii) DG Nova/Eclipse (iii) HP 2100
(b) Mainframes: (i) Univac 490/1100
(ii) IBM 370 (large machines only). Interviews will be held by us in mid and late January, after which selected candidates will be invited to spend a day on the company's premises for final selection.

Burroughs Programmers and Analysts Netherlands and Belgium

Salaries: £12K-£15K

An Important Financial and Banking Institution based in Benelux and having one installation in the Netherlands and its Headquarters in Belgium requires PROGRAMMERS and ANALYSTS to join its Development Teams in Spring 1979. Both installations run BURROUGHS mainframe hardware and consequently it is a pre-requisite to offer current expertise on that Company's medium and large scale equipment either in a Programming or Analytical/Designing capacity. These positions represent an outstanding opportunity for those who have had exposure to Financial, Commercial and

Banking applications. You will be offered a permanent career position at one of the two installations and be expected to integrate into both the work and social fabric of the local community. To assist you, generous relocation and accommodation allowances will be paid, language tuition courses are available for all employees. Whilst we will conduct Initial Interview, you will be required to spend one full day at the Company's Headquarters — of course at its expense for further interview and selection.

Small Business Systems London and Home Counties

Salaries: £5K-£8K (+ bonus)

A multi-national Manufacturing and Package Development Company decentralised throughout London and the Home Counties (both South and North of Thames) is seeking additional Programmers and Systems Analysts in both pre and post sales capacities who will be engaged in the development of a variety of new commercial applications. Suitable applicants are likely to have worked already for a V.R.C. supplier, Mini or Micro Manufacturer or in an O.E.M. environment. Naturally past programming performance will be most

important and these candidates with knowledge of either Basic or Business Assembler will be of particular value reflected in the above market salaries you will be offered. Additional fringe benefits include a non-contributory pension scheme, sickness and medical benefits, life assurance entitlements, project performance bonus and a minimum of 20 working days holiday. Interviews throughout January and February will be held at the branch office most convenient to individual candidates.

Logistix, Freeport 32, London W1E 3YZ
01-491 4636
(Reverse charges) **Telex 28800**



Avon House, 366 Oxford Street, London W1N 9NA

MINI ITALY
DISTRIBUTED PROCCING
£9K + Ocas Allow.

MINI MICRO HOLLAND
CONSULTANTS & PROGRAMMERS
£10 — 16K + Benefits

Would you like to join a creative team of Mini Computer specialists working on Distributed Processing systems within a business environment? The retail hardware is Honeywell 100/100, however direct experience of either is of minimal importance. Successful candidates will have substantial experience of Mini Computers preferably with Assembler and/or a high level language within a Real Time environment. Initial four days training will be given with the option to transfer to the company's U.K. headquarters or return for a further year. Full relocation expenses will be paid for yourself and family. A generous overseas allowance (tax free) is also offered.

DATABASE E.E.C
LONDON £7.9K
EUROPE £9.15K

SOFTWARE ENGINEERS
BELGIUM & GERMANY
£12,000-£15,500 p.a.

This California based International Company has openings in its London, Amsterdam, Frankfurt and Zurich offices for Database Administrators, Designers and Applications Programmers. Any experience of current DBMS would be useful whether on Mainframes or Minis. Of particular interest is IMS, TOTAL, ADABAS, DMS, IDMS, etc. Hardware background is of no consequence; what is important is your depth of experience in your relevant area of Database expertise. You would be joining a market leader in the design and implementation of advanced Data base systems. They offer unequalled opportunities to develop your career at the sharp end of technology.

MATRIX
360 Oxford Street
London W1N 9HA
01-491 4636

IBM Systems Engineers with Teleprocessing and/or Data base backgrounds are required by this U.S. International Client with European HQ in Brussels and regional offices in Frankfurt, Paris, Zurich and the U.K. Experience within either a Banking or Production Control environment would be desirable. Assembler or PL/I are the programing languages. Foreign language knowledge is not required but could be helpful. You will be paid an excellent salary in addition to a wide range of fringe benefits. Language courses will be provided as well as education expenses. Interviews will be held in London as soon as applications are received.

SOFTWARE ENGINEER
C £7,000

We are a small but expanding electronics company with considerable expertise in microprocessor technology. Due to our increasing involvement in microprocessor applications we need an experienced software engineer to strengthen our design team.

He/she will be responsible for the design, writing and testing of software for our systems, liaison with our hardware engineers and commercial staff in the definition, development and installation of the systems, and ensuring product support.

Applicants should be aged 25-35, self-motivated, disciplined, with wide experience of system design and programming at all levels. Knowledge of logic design and computer architecture is also required; experience of user liaison would be an advantage.

Applications to:
Mr. S. Stratton,
Spher Design (Electronics) Ltd
Unit 17,
Chilton Trading Estate,
Earl Howe Road,
Halmston Green,
Dunfermline.

S.D.

STEVENAGE COLLEGE
DEPARTMENT OF BUSINESS AND PROFESSIONAL STUDIES
LECTURER GRADE II
in COMPUTER STUDIES

With experience in Bookkeeping and Accounting Systems

Applications are invited from suitably qualified persons for the above post which is payable from 1st February 1979.

Further details and application forms, returnable within 14 days of the appearance of this advertisement, are available from the Principal, Stevenage College, Munkwood Way, Stevenage, Herts. SG1 1LA.

THE OPEN UNIVERSITY
FACULTY OF MATHEMATICS
RE-ADVERTISEMENT

LECTURESHIP IN COMPUTER STUDIES

Applications are invited for a lectureship in computer studies to be filled either as a permanent tenured post or as a secondment (two years). Appointment to a tenured post will be made at a suitable point on the lecturer scale (£3,883-£7,764 — under review) for appointment to the post on secondment the University pays the seconded's employer for the costs of existing salary.

Successful applicants will be involved in the writing of a second level computing course to replace the Faculty's two existing courses PM 951 "Computing and Computers" and M251 "An Algorithmic Approach to Computing".

Application forms and further particulars are available from The Recruitment Office (MB234/1), The Open University, P.O. Box 75, Walton Hall, Milton Keynes MK7 6AL, or telephone Milton Keynes 63408; there is a 24-hour answering service on 63868.

Closing date for applications: 31st January, 1979.

*** IBM COBOL PROGRAMMER ***

Permanent or contract from Feb./Mar. to work in project team developing financial systems on an IBM 370 for a North of London client.

Expenses and opportunities for team database techniques.

Contact Ian Gold, on 01-388 0036, 38 Warren Street, London W1P 5PD.

Fraser Williams
computer consultants

Operators & Controllers
Move into the 1980's...
As a Programmer
Croydon

As a leading financial organisation, we are able to provide excellent career opportunities in data processing which begin with a structured training programme, tailored for Operators and Controllers with the right background (which should have included IBM OS).

In our friendly, well integrated Systems Division we are working on exciting database developments for management information, CICS, word processing and other systems. The mainframe, at present a large IBM 370, will be connected to a network of specialised minis initially 3780's upgrading to 8100's.

We will train you to the high standard required for your future involvement with MVS, TSO, teleprocessing and distributed processing hardware. You could be writing COBOL within six weeks, and work on a project right from the start. Our training makes use of Improved Programming Techniques.

Promotion prospects for men and women within this dynamic and progressive organisation are extremely favourable. Benefits include exceptional salaries, non-contributory pension scheme, free life assurance, BUPA, flextime, LVs and sports and social club. For an application form phone or write to:

Rosalind Sykes, Personnel Department,
Lowndes Lambert Group Ltd,
PO Box 431, 55 Eastcheap, London EC3P 3HL.
Tel: 01-283 200 Extension 3105.

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BOROUGH OF SOUTH TYNESIDE
DIRECTORATE OF FINANCE
SYSTEMS ANALYST (2)
£5232 to £5568 inclusive
SENIOR PROGRAMMER
£5232 to £5568 inclusive
PROGRAMMER
£3279 to £5073 inclusive

The Authority is now actively planning for the introduction in late 1979 of an ICL 2950 Computer with communications equipment to replace an ICL 1902A.

Applicants to join the Computer Division should have relevant experience, with knowledge of GEORGE 2 and on-line processing an advantage. Training will be given if required.

Application forms are available from the Chief Personnel and Management Services Officer (Ref. 64), Westoe Hall, Westoe Village, South Shields. Tyne and Wear (Tel. South Shields 552191) and should be returned by noon, 19th January, 1979.

LOTHIAN REGION EDUCATION AUTHORITY
STEVENSON COLLEGE OF FURTHER EDUCATION
COMPUTER PERSONNEL

Immediate full-time or part-time teaching vacancies exist in the Business and Computer Studies Department of the above college for suitably experienced computer personnel. Previous teaching experience not essential.

Salary Scale: Lecturer B £3423-£5331

For application form and further particulars apply to —
The Principal
Stevenson College of Further Education
Bankhead Avenue, Sighthill, EDINBURGH EH11 4DE
Tel: 031-443 7111

Senior Programmer
PUTNEY
£6,500

Our clients have recently invested in an ICL 2900 system to provide a management services function to 4 Autonomous Profit Centres. Users are aware of the benefits and opportunities inherent in this commitment to data processing, and the future is charged with growth potential!

The major development phase, commencing with an integrated Production Control System, promises SUBSTANTIAL CAREER OPPORTUNITIES to the computer professionals involved at this stage.

Your background should comprise sound COBOL programming experience with some Analysis and Design, ideally in an on-line environment.

As the leader of the programming team you will be responsible for the successful implementation of the total development phase and will report directly to the D.P. Manager.

They see the challenge as being attractive to a self-motivated individual, possessing good communication and his fair share of energy. We also feel that you will find your working environment — set near the Thames particularly pleasant.

Please write in confidence with a brief career history and personal details to:

Streets
Recruitment Advertising Division
D. Harden,
Streets Advertising Limited,
11 New Fetter Lane,
London EC4.

indicating the names of any companies to whom you do not wish your applications to be forwarded.

Servelec
ANALYST/PROGRAMMERS
TO £8,500 + BONUS

We are a young, expanding Computer systems house with a solid client base, involved in micro/midrange computer based automation/control systems.

We are establishing project teams and require analyst/programmers with the following qualifications:

- 1-3 years programming experience, including assembly language
- Ability to understand hardware
- Problem solving capability
- Professional Outlook and ability to communicate

We offer rapid career development with regular salary reviews, staff pension and insurance schemes, together with all the usual company benefits.

CALL OR WRITE TODAY: John Archer, SERVELEC COMPUTER SYSTEMS LTD., Churchill House, Telford, Shropshire, Staffs. Telephone (041) 872 0889 or Walsley (0141) 872 0889.

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied, 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8016.

JBA
TECHNICAL ANALYST
N.W. CHESHIRE
UP TO £8500

A leading banking organisation wish to appoint a senior analyst in their computer division to provide a detailed technical service to the central board. The work will be highly varied but principally concerned with the evaluation of hardware and software for communications systems, both large and small networks, supporting a wide range of peripherals.

Candidates should be qualified to degree level and have an impressive track record in the d.p. industry to a point beyond conventional systems analysis. The ideal candidate will have sound experience in at least three of the following: systems/operational software design; real time/database techniques; data communications and security systems; mini/micro computer hardware/software; peripheral product/prototype development; hardware sizing and configuration.

The appointee will enjoy high remuneration, non-contributory pension scheme, free life assurance, and house mortgage subsidy in addition to generous relocation expenses where necessary.

Contact: Mike Creamer
JAMES BAKER ASSOCIATES
International Personnel Consultants,
16 Maddox Street, London W1. Telephone: 01-491 4478.

CHECK LIST FOR A JOB MOVE TO GERMANY
COMMERCIAL SYSTEMS PROGRAMMERS DM 46K - DM 60K

RESPONSIBILITIES	— To develop a range of Commercial Systems Applications on advanced real time equipment — taking total responsibility for launching the systems into the international market place.
LOCATION	— Choice of three, all based in Germany — with superb facilities.
TRAINING	— Where your current programming skills are not relevant our client will offer a full training schedule.
EXPERIENCE	— Systems Programming on equipment similar to the following would be of interest to us — IBM System III & 32 — 2903 — System 10 — NCR 8200 — Burroughs B80/B800 — DG Nova — PDP II — Nixdorf 88.
SALARY	— By negotiation and according to experience — circa DM46K to DM60K.
TAX	— Lower than UK.
ADDITIONAL BENEFITS	— House move assistance — German language training — Family education facilities — Medical Insurance.
CAREER BENEFITS	— The Company is international, profitable and expanding — Job interest is of prime importance to them, career development can be rapid and if required in other countries where they have subsidiaries.
	They will want to hire self sufficient and ambitious computer professionals who wish to take project responsibility. They will look for individuals whose skills in programming and systems are current and who are looking for a move to Europe that has real prospects.
ACTION	— Phone for initial discussion or write for an appointment. Ref. DS3.

INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD.
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LONDON W1M 4AJ Tel: 486 5844

April 1st 1979

PROGRAMMERS STEP INTO ANALYSIS

ANALYST/PROGRAMMER

TO £6250

BUCKINGHAMSHIRE

If you have a minimum of two years' commercial programming experience using COBOL and are keen to...

- * Gain IBM experience on a 370/158 under MVS.
- * Develop analysis skills.
- * Be responsible for design.
- * Develop team leading skills.
- * Receive training in database design, using IMS.
- * Work with on-line real-time applications.

with a Company offering:

- * Excellent starting salary.
- * Five weeks' holiday.
- * Staff restaurant.
- * Relocation expenses.
- * Rapid career progression.
- * An active sports and social club.

This Engineering Company, situated 20 miles from London, offers an excellent career as a member of a professional systems and programming team currently developing a wider variety of applications to meet the system requirements of the business well into the 80s.

Ref. E2/0401

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Telephone or write to:- 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

VICTORIA APPOINTMENTS LIMITED

79/11 DE FINE WITH A NEW JOB THROUGH

LOCATION	JOB	COMPUTER	EXPERIENCE	SALARY
Liverpool	Programmer	IBM	10 yrs 3 yrs Cobol	Up to £1000
Manchester	Prog-Analyst	New IBM 370	1005 CICS Cobol DL-1	£1000
Preston	Systems Analyst	ICL	2 3 yrs Commercial	£1000
Liverpool	Shift Manager	IBM	Grad 5 yrs Ops	£1000
Warrington	Systems Prog	IBM 370	CICS VS-1 D S	£1000
Blackburn	Analyst Prog	New ICL 2902	Cobol RPS Commercial	£1500
Manchester	Chief Prog	IBM	5 yrs Cobol On-line	£1000
Liverpool	Systems Prog	2902 DEC	4 yrs Plan-Cobol T.P.	£1000
North West	Systems Analyst	2902	On-line Advan Cobol	£1000-£1200
Manchester	Project Leader	IBM 370	Manufacturing/Production	£1700
Sheffield	Sen Prog	ICL 1900	See IBM Cobol 3 yrs	£1500
Leeds	4 Systems Analysts	IBM 370	1005/VS Cobol On-line	£1500
Liverpool	1 Systems Analysts	IBM 370	Cobol Manufacturing	£1500

North of England - Freelancers - Contact us for the contract to suit you
For an application form in respect of any of the above and hundreds of other vacancies write or telephone Miss Val Halliwell on 061-236 7319 (24 Hrs. Answering Service) or 061-236 7417. Home 061-440 8134

VICTORIA APPOINTMENTS LIMITED

24 Mosley Street, Manchester 2
061-236 7319 (24-hr. answering service) and 061-236 7417

ROYAL SOCIETY OF ARTS EXAMINATION BOARD

ASSISTANT SECRETARY

Applications are invited for this post which will be based at the Board's Orpington office and will be concerned with the development and administration of systems for the Board's examinations. Candidates should possess a degree or a similar qualification and should have experience in at least two of the following areas: administration of examinations; development of systems; application of computer processing to administration; application of statistics to education. Salary £5890 x 235 (5)-£7065.

Application forms and further details concerning this post may be obtained from the Secretary to the Examinations Board, Royal Society of Arts Examinations Board, 18 Adam Street, Adelphi, London WC2N 6AJ, to whom completed application forms should be returned by 31st January, 1979.

Contract Requirements

ICL 2900 VME/8 COBOL

Vacancies in UK/EUROPE starting in early 1979 long and short term requirements for programmers, analysts and systems programmers

Call Richard or Suzy on 01-491 4706



Knight Software Division
Staff Services Division of BOC Dataflow and a member of Computer Services Association

UNIVERSITY COLLEGE OF NORTH WALES, BANGOR

RESEARCH OFFICER

Applications are invited for the post of Research Officer in the College's Department of Agriculture. Applicants should have a degree in a suitable subject with a high computer science content, and some knowledge of statistics.

The successful applicant will be required to assist in the design, development and evaluation of computer-based systems for the College's research projects.

The appointment, lasting for 2 years, will be for 2 years in the first instance, and will be renewable.

Applications should be sent to the Department of Agriculture, University College of North Wales, Bangor, Gwynedd LL57 2UW, and will be considered on the basis of the written application only.

Closing date for applications: 22nd January, 1979.

RSX-11M

MACRO II, FORTRAN

£5.5K + Car

COBOL CROYDON

IBM OS/VS

£5.5K p.a.

The Mini Real-Time division of this important Client based in the North West London area has openings for several programmers with experience ranging from 2-7 years. The applications are commercial and based on PDP 11 hardware running under RSX-11 Real-Time system. You should have very sound experience of either Macro II or FORTRAN and ideally both. Any additional experience relating to retail systems will be considered especially welcome. The client offers a young dynamic environment with a company car and free BUPA. Interviews will be held around mid January.

Would you like to join a Commercial company based in London? Put your COBOL programming experience to better use by joining our client in developing On-line and Data base systems. Necessary training will be given where applicable. Both OS and IMS programmers are required and to a limited extent a number of Analyst Programmers. A thorough background would be an advantage but is not a prerequisite. Salaries will be in accordance to previous experience but will be given for potential. A subsidised mortgage is available in addition to a range of other benefits. This total package is in our opinion very attractive.

1900-2900 LANCASHIRE

COBOL PROGRAMMERS

£5,500-£6,500 p.a.

REAL-TIME

SYS 3/32 + PDP-11

C London £6-8K

A major Public Company in Retail and Manufacturing sector has recently upgraded their ICL 1900 to a Real-time system and now require additional COBOL Programmers to develop new systems and assist in the conversion of the 1900 based systems. Programmers and Analysts up to and beyond Team-leader level are sought. The salaries will be above regional average and based on your experience and potential. Previous experience within the Retail/Manufacturing industry would be useful. Assistance with relocation will be considered along with important other fringe benefits. The working environment is excellent. Interviews will be held any time during January.

A prestige U.S. Software House has immediate vacancies in their London offices for programmers with any of the following experience: (1) IBM System 360/220 RSX-11 with PDP-11, CORAL, ALGOL or Pascal - Real-time Systems Programming; (2) Macro II on PDP-11. Financially oriented background is preferred. Opportunity to travel available on one who enjoys the freedom and autonomy of overseas assignments. This client offers above average salaries to individuals who can demonstrate ability and a creative approach to Commercial Data Processing. Relocation expenses will be paid where applicable and interviews will be held as soon as applications are received.

MATRIX

360 Oxford Street

London WIN 9HA

01-491 4636

KNIGHT PROGRAMMING SUPPORT LIMITED



NORTHERN OPPORTUNITIES

PROJECT MANAGERS LANCS. c £7,100

A 5% subsidised mortgage scheme and relocation expenses are offered to successful applicants. Our client requires Project Managers to run teams of Programmers and Analysts, an IBM 370 and COBOL background, with management experience is essential. Ref. 1037

UNIVAC PROGRAMMERS NORTH WEST c £5,166

This company offers to employees a house purchase scheme and Flexitime. They are a large Merchant Bank with installations throughout the U.K. and require Programmers with UNIVAC experience. Ref. 1022

ANALYST PROGRAMMERS LANCS. c £6,000

This Company is rapidly expanding so there are great promotion prospects for a career minded person. There are current vacancies in Pensions, Accounts, and in the Computer Centre. IBM 370/158 and E.D.P. experience is an advantage. Ref. 1026

TECHNICAL ANALYST SHEFFIELD c £6,000

A Company car is an added bonus with this position. The company has 25 D.E.C. 11s and is moving into Telecommunications. It is a small young team and there is a variety of work. Knowledge and experience of P.D.P. design, mini computer and telecommunications is an advantage. Ref. 1039

PROGRAMMER LANCS. c £5,250

Our client, a City Centre based Company are in need of an IBM 370 Programmer Assembler and D.U.S. knowledge or experience are an advantage. Relevant experience also include C.I.C.S and TOTAL. Ref. 1003.

SENIOR SYSTEMS ANALYSTS NORTH WEST c £6,000

This Company are to undertake a major conversion from I.C.L. 1902 to an IBM 370. A team of alert capable Analysts are required for the conversion. Experience in the above hardware is a definite advantage. Ref. 1008



FOR DETAILS OF THESE AND OTHER VACANCIES PLEASE CONTACT JOAN JOHNSTONE

143/144 ROYAL EXCHANGE, MANCHESTER. TELEPHONE NO. 061-833 9341/5

AUCKLAND NEW ZEALAND

APPLICATIONS ANALYSTS PROGRAMMER ANALYSTS

IDAPS is an independent bureau specialising in insurance, finance and manufacturing distribution. Founded in 1970 as the data processing arm of the New Zealand Insurance Group it is now one of New Zealand's most respected data processing organisations. IDAPS attracts their success firstly to their people, secondly to their specialisation and finally to their policy of keeping to the forefront of information technology.

The equipment comprises an IBM 370/148 in Auckland and a 370/135 in Wellington. A communications network links the computers to 18 centres throughout New Zealand. Their main programming language is COBOL.

They require a number of applications analysts and programmer analysts for their Auckland centre. A background based on IBM equipment and methods is an essential requirement. Candidates will be able to join the 21 to 35 age group and will wish to settle in New Zealand.

Yearly salaries, as may be expected from a successful people company, will be a fully competitive New Zealand salary (\$5,000 to \$18,000 per annum, reviewed after 6 months) plus excellent fringe benefits. These, plus financial assistance with relocation, will be detailed in your response.

Prescott Computers specialise in recruitment for New Zealand and are providing IDAPS with the assistance of interviews by Prescott and/or a formal interview by IDAPS will take place throughout January. We would prefer to interview you in your own locality if this can be arranged, and would therefore like a quick response from you. Please telephone Chad Stohler at 01-242 2142 or if you prefer, write to him at:

Prescott Computers Limited
6 Blenheim Square
London WC1A 2LP

Tel. 01-242 2142

ATTENTION — SENIOR OPERATORS

wishing to step into DP MANAGEMENT

DP MANAGER c. £4,500

The Lincolnshire Standard Group Ltd., Lincolnshire's leading weekly newspaper group require someone to take responsibility for their DEC 11/34 real-time system reporting to the Management Systems Manager of the Group.

The successful applicant will be expected to liaise with the software house development turnkey systems; supervise their successful installation, and ensure the efficient daily running of these and existing systems.

At present the system covers the Accounts and Newspaper Circulation functions. Future developments include Advertising Order Entry and, possibly later Newspaper Production systems.

The job should appeal to senior operators or those of similar calibre, who are ready to take the first step on the management ladder. An enthusiasm for programming, with a view to carrying out minor modifications, would be desirable.

The installation is in the early stages of development, and there is scope for an ambitious person to develop along with it.

The Group's offices are situated centrally in the attractive city of Lincoln, where commuting could be a ten-minute walk.

The usual benefits associated with a major company are offered.



Write for an application form to:-
Mrs. A. Freeman
Lincolnshire Standard Group Ltd.
Witham House
Petham Bridge
Lincoln LN5 8XK
or phone Lincoln 31631

BBC COMPUTER SERVICES

Technical Support Unit

PROGRAMMER

to support IDMS on ICL 2960s

The installation includes 2 ICL 2960s running under VME/B, supporting TP, MAC, distributed processing and IDMS database.

We now seek someone with experience of database implementation (not necessarily under IDMS) to join the Technical Support team. He/she will assist us in supporting IDMS users of BBC computers, by consultancy, project participation and training, implementing, testing and maintenance of database software and development of new facilities.

The Technical Support Unit is located at the BBC Computer Centre in West London.

The salary will be in the range £5,200-£6,800 (currently under review).

Please apply for an application form enclosing addressed envelope and quoting reference number 1886/CV to Appointments Department, BBC, London W1 1AA, telephone number 01-4468 Ext. 4618.



MID DEVON DISTRICT COUNCIL

Treasurer's Department

Systems Analyst and Computer Programmer

Salary Grade AP4/5
(£3932-£4781 + £312 supplement)

Applications are invited for the above post from men and women with a minimum of two years' experience in programming. The present equipment comprises 2 Burrells L3090 (programmed in LTO Assembler (GP 300)) and an IBM 3741 programmable work station (programmed in ACL) with teleprocessing links to Plymouth City Council's IBM 370.

The Postholder will be the senior member of the Computer section and will have the opportunity to gain useful experience in a variety of applications. Preference will be given to applicants with Local government experience.

The Department is located in the market town of Tiverton which is situated close to the M5 motorway and is surrounded by delightful countryside. Assistance towards removal expenses, legal fees, etc. (maximum £350) available to officers recruited from outside the District Council area. Application forms and further particulars can be obtained from Mr. J. W. Lyle, Personnel Officer, Mid-Devon District Council, 2 St. Peter Street, Tiverton, Devon (Tel. Tiverton 4911 ext. 218), and should be returned by Friday, 26th January, 1979.



DP Consultancy

People & Computers

Computer professionals build their early career in a technical world where the emphasis is on the computer. If computer systems are to work, however, it is the people who use those systems who are important!

Consultancy offers a career step to experienced computer professionals which will build on the technical base of knowledge by giving an opportunity to see computer systems from the standpoints of top management and user management, and to gain experience in designing and implementing computer systems with this "people dimension" uppermost in their minds.

Added to this is the variety of environments - company, industry, systems - with a consequent opportunity to consider various ways of organising EDP departments and computing/communications facilities.

We are looking for a few people, in the preferred age group 25-35, to whom this prospect is attractive. If you are interested, please telephone Ernest Morris on 01-606 4010, ext. 2665.

Coopers & Lybrand Associates Ltd.

Management Consultants

Shelley House, Noble Street, London, EC2V 7BQ

THE UNIVERSITY OF MANCHESTER REGIONAL COMPUTER CENTRE

Director Professor Gordon Black

Applications are invited for the following vacancies

SENIOR PROGRAMMER OR PROGRAMMER

The successful applicant will lead a team responsible for the development and support of the GEORGE 3 Operating System on ICL 1900A, 1904S and will be involved in planning future installation developments in the Centre. Current project areas include the implementation of the North West Universities Network System and the reorganisation of the University's data processing resources.

Applicants should be educated to degree standard and should have some experience of system programming. Experience with ICL 1900A, 1904S and the successful candidate will also be expected to have a family wife and take part in the activities of the Union and the University of Manchester.

Applicants should be prepared to relocate to the University of Manchester. Salary £3,389 to £4,242 p.a. or £3,313 to £4,174 p.a. U.S.

TWO ASSISTANT COMPUTER OFFICERS

These posts will be in the documentation and information section which is responsible for acquiring technical and organisational information and presenting this to users. This section is part of the University of Manchester and the successful candidate will also be expected to have a family wife and take part in the activities of the Union and the University of Manchester.

Applicants should be prepared to relocate to the University of Manchester. Salary £3,389 to £4,242 p.a. or £3,313 to £4,174 p.a. U.S.

Further details and application forms concerning these vacancies should be obtained from the Registrar, The University of Manchester, Oxford Road, Manchester M13 9PL. Applications should be sent to the Registrar by Friday, 26th January, 1979.

COMMUTING PROBLEMS?

IAL, with a 30 year background in communications systems is currently engaged in the supply of computer-aided dispatch systems, both in the UK and overseas. For example, systems are in operation with police forces in this country handling police incidents and aiding resource allocation on a fully real-time basis. IAL is also currently working on a major project for a Canadian city where all three emergency services — fire, ambulance and police — are being totally integrated. Further projects of a similar scale and nature are currently under consideration in a number of locations world-wide.

This background means we can offer something more than the usual day-to-day routine for Analysts/Programmers with real-time experience, covering two or more of the following aspects:

- *Mini-computer systems *FORTRAN *CORAL
- *ASSEMBLER *Real-time software design
- *Data General Software
- *Multi-tasking operating systems

You will be working at IAL's well-equipped headquarters conveniently situated near Heathrow Airport and there is a possibility of occasional overseas travel to meet the customers. The salary is around £7,000, dependent on experience, the benefits good and relocation expenses will be considered.

TIRED OF THE DATA-DAY ROUTINE?

If you would like a break from the usual routine, please write with c.v. or telephone The Recruitment Officer, IAL, Aeradio House, Hayes Road, Southall, Middlesex quoting ref. 001K. Tel: 01-574 5134.



Aviation and Communications
Systems and Services—worldwide

Applications are welcome from both men and women.

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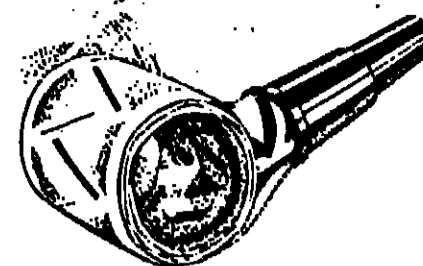
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کتابخانه ملی



Application forms are available from the
Council Office, County Hall, George Street,
Northampton. Tel: Northampton 54001 or
5237 or 5617. These should be received by
January 14th 1979.




**Northamptonshire
Treasurers' Association**

SALARY RANGE £4,500-£4,500
should send a Curriculum Vitae to
Peter T. Kirstein, Dept. of Biology,
University College, London, Gower

6629510 - 6629590

PERIODICITY: ANNUAL; FIRST YEAR: 1974; LAST YEAR: 1976; STATUS: IN PROGRESS



52 Shaftesbury Avenue, London W1V 7DE. 01 734 8862 (Day or Evening) P.O. Box 83, Copthall Tower House, Harrogate HG1 1TS. Tel: Harrogate 66628



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computer consultants



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IBM	COBOL CS Project		
	Lander	Holland	6 months
ICL	7502/1900 Linkage	Egypt	3 months
ICL	2400 VMEC	Hong Kong	6 months

Apply NOW for the latest vacancies. IBM, HONEYWELL, DEC & ICL programmes welcome. Earn a Christmas holiday pay boost plus an attendance BONUS. Ask to find out 01-895 4148.

Hardware Systems Engineer

Middlesex

The Electronics Division of a Multi-National company based in Middlesex need to increase their support team on their Distributed Processing Communications Hardware. The company uses distributors to market their products world wide.

They require an experienced hardware engineer to join a small team in continually evaluating new Hardware products to add to the company's existing product range.

Candidates should have an academic qualification Electrical/Electronics Engineering, direct Hardware Support, write their own test programs, exposure to training and product launches.

This is an ideal opportunity for an experienced engineer to join a small dynamic team supporting communications Hardware and evaluating and testing new potential products at the forefront of the industry.

CW/1/1

Analysing Your Users' Needs

Berkshire

£6500

We wish to recruit SYSTEMS ANALYSTS to join a large diversity group with controlling interests in a wide range of Engineering, production and services companies. Within its Management Services Centre there is a very strong emphasis for SYSTEMS ANALYSTS to deal on a day-to-day basis with the various users to solve their computerised needs ranging from very small to large.

Accordingly we wish to hear from SYSTEMS ANALYSTS who enjoy a lot of contact with users and who have enough experience and ability to help solve their requirements. The installation is based on ICL hardware and utilise ON-LINE systems for the larger projects.

ANALYST/PROGRAMMERS with a similar bias as above would be welcome to apply to discuss moving further into Analysts and user Control.

CW/1/2

Small Business Systems

West London ASSEMBLER £4500-£8300

A major international Systems House who are better known for their mainframe work have a fast expanding Small Business Systems Division.

They have an urgent need to recruit people who range from Programmers with 2-3 years experience through to Senior Project Leaders.

All you need is experience of ASSEMBLER on any machine, but if you have experience of SYSTEMS DESIGN, REAL TIME ORDER ENTRY, or ORDER PROCESSING so much the better. Projects are all based on Real Time APPLICATIONS on the ICL SYSTEM 10 and SINGER 1500 hardware.

Project teams usually consist of 2-3 people, allowing you to follow the project from specification through to implementation.

Salaries are well above market rate and the company can offer excellent career opportunities. Annual Bonus, plus usual Company Benefits one would expect from a company of this size.

CW/1/3

Customer Support Consultants

£6000-£7000 + Car

Our client are a Worldwide market leader in interactive computing services who have been established for over ten years. Can boast an annual growth rate of over 30% during the last nine years. They have vacancies in many of their offices throughout the UK for CUSTOMER SUPPORT CONSULTANTS to help maintain this success over the next ten years.

The successful candidates will be required to provide Technical Support Salesmen covering a wide range of applications areas and Business functions. We would like to hear from people in the 25-35 age bracket, preferably with a degree or equivalent who have had some DP experience and a knowledge of one High Level language preferably FORTRAN but this is not essential.

This position will appeal to those people who find that their present position does not give them the challenge or satisfaction they desire.

A lot of time and money will be spent on training you for this position and developing your career thereafter. Coupled with a policy of promotion from within, this appointment offers excellent career opportunities for those who are successful.

There are also vacancies throughout the UK for SALES CONSULTANTS & APPLICATION CONSULTANTS.

CW/1/8

Systems Analyst

Dublin

£neg.

An International Company requires an experienced Systems Analyst for a new development programme. Good commercial systems experience in a DOS/VS environment would be ideal, but the successful candidate must have completed at least one major commercial system. A programming background in Cobol would also be a help as would a professional qualification. The appointment carries an excellent negotiable salary with outstanding career prospects.

Write or telephone Gerald De La Mere at Dublin 789577.

CW/1/5

2900 Programming in Berkshire

Systems Programmer

Cobol Programmer

One of this country's earliest users of an ICL 2950 require additional people for their programming function.

The installation of VME/K has caused their need to recruit an additional SYSTEMS PROGRAMMER to join their Systems Programming Team. Candidates with Systems Programming experience would be ideal but consideration for people with an Operations background, will also be given, who can mature into the role.

COBOL PROGRAMMERS with 1-2 years' experience will also be interested in joining an installation that employs the latest technology to produce efficient ON-LINE systems and offers its employees exposure and training on advanced software techniques.

CW/1/4

Programmer

£5,000-£6,000

South Coast of Ireland

An international company with two plants on the south coast requires a Programmer for their growing D.P. department. A Systems 3 model 1 SD will be installed in March, 1979, and a more advanced machine in 1980.

A competent Programmer in RPG-11 is required and our client is flexible in the degree of experience you should have. Design work and all aspects of project development in an on-line manufacturing environment awaits the successful candidate.

A guide to your salary expectation is given above together with fringe benefits, relocation expenses will be paid where appropriate.

Write or telephone Gerald Delamere at Dublin 789577 or at address below.

CW/1/7

Systems and Communication Programmers

West London

£4800-£9300

We would like to hear from Programmers with at least 18 months' Assembler who are seeking the opportunity of becoming involved in the Microprocessing side of D.P.

Your Assembler experience could have been gained on either Mainframes or Minis and a knowledge of Communications would be an advantage. We would especially like to hear from people who have direct experience on Intel 8080 and 8085.

Our client, who are an internationally known Software House, are prepared to offer excellent salaries, and career paths to the right people.

CW/1/8

Systems Analysts Programmer

West Country

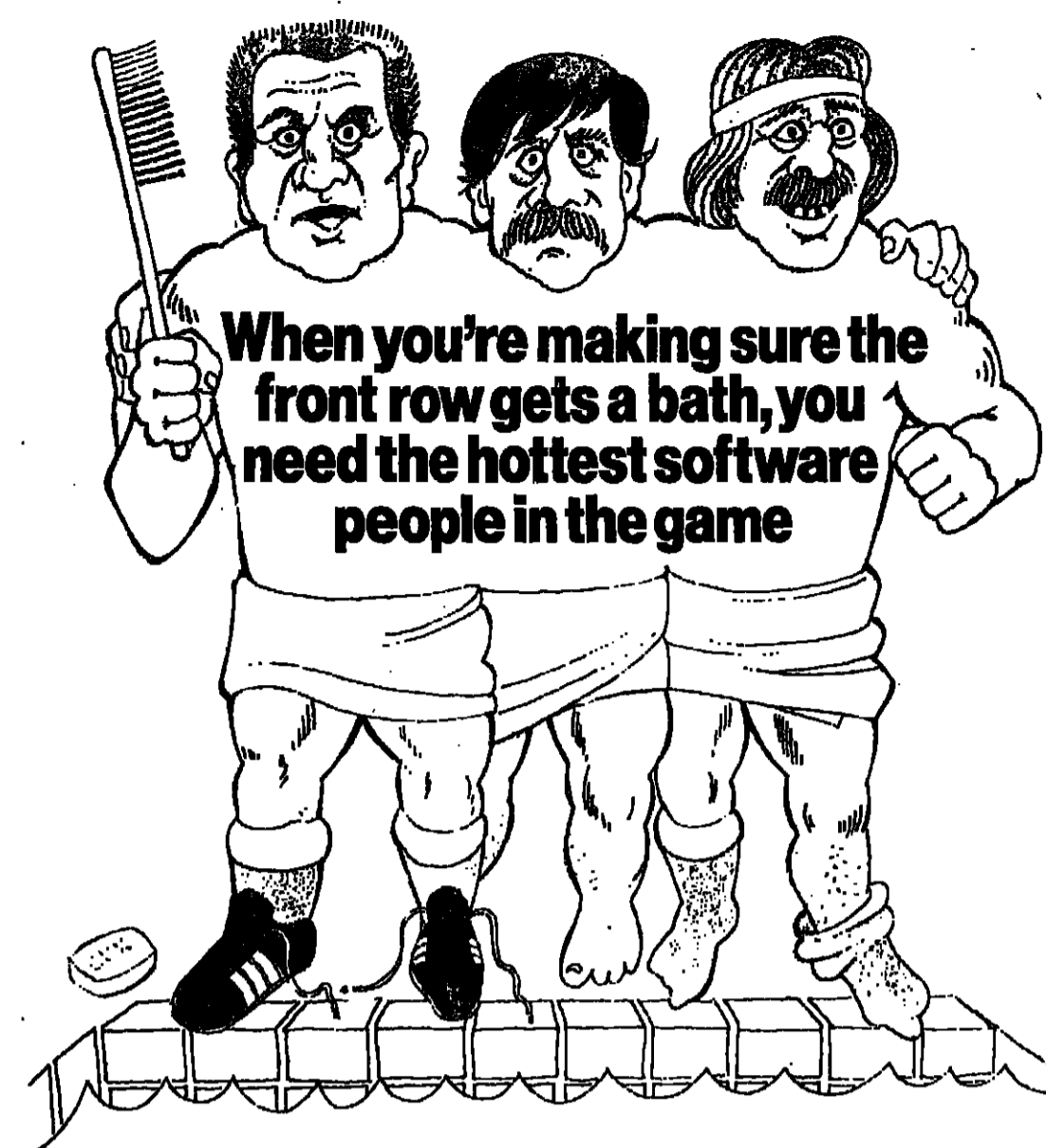
£neg.

A large manufacturing company, located in the WEST COUNTRY, who also have an ICL mainframe, are currently developing new systems on MINI-COMPUTERS, and to assist with this development they require a SYSTEMS ANALYST with at least three years' experience of systems analysis and design, who has successfully implemented a real-time system.

Also required is a COBOL/BASIC PROGRAMMER with at least two years' experience, who has a knowledge of mini-computers and ICL equipment.

Our clients can offer an excellent career path for the right candidates, as well as the usual benefits of a large company including a contributory pension scheme and active sports and social activities.

CW/1/9



You'd be surprised at the people who rely on our expertise in the design of advanced computer systems.

And all the things they rely on us for. Our customers are the world's public utilities. We need a number of software professionals at all levels to work on advanced projects, both in the design and development and in the installation.

Your practical experience of systems software work using PDP11's or Micros could be of great interest to us - and a great help in the development of a really progressive team of knowledge of IBM, ILL, ICL, CORAL, MAC, PDP11 or ILL, Assembler would be an added advantage. Salaries up to £20,000 per annum depending on experience.

For further information, please contact: Technical Director, Wesdac Systems, Wokingham, RG40 3AB (0491) 790997 - or Mr. W. J. Williams on 0491 8167062 after normal hours or Saturday.

wesdac
Wesdac Systems, Wokingham, Berkshire

DEPARTMENT OF COMPUTING SERVICES CHIEF ANALYST

Applications are invited for the post of Chief Analyst in the Computing Services Department. The successful candidate will be responsible for the systems required by the Administration (eg Student Records System).

The Polytechnic has recently installed a DEC 20 to replace a 1905E and the Administration programs are currently being converted.

This post will require a good working knowledge of COBOL knowledge of ICL 1900 COBOL or RPG2 would also be an advantage. It is unlikely that an applicant who has worked for less than three years with COBOL would be considered sufficiently qualified.

Salary: SD1 £4920-£5268 plus supplement of £312 p.a.

SYSTEMS PROGRAMMER

Applications are invited to assist in the installation, maintenance and development on the Polytechnic computers which include a DEC 20, 11/40 and a Data General Nova.

A good knowledge of at least one of the high level languages used at the Polytechnic is necessary (Fortran, Cobol or Basic), together with experience of one assembly language. Salary: £4461-£4761 plus supplement of £312 p.a.

Further details and forms of application available from the Assistant Director and Chief Administrative Officer, Trent Polytechnic, Burton Street, Nottingham. Closing date: January 20, 1979.

TRENT
POLYTECHNIC
NOTTINGHAM

McGIRN AND ASSOCIATES PTY. LTD.

AUSTRALIA 1 AND 2 YEAR EMPLOYMENT ASSIGNMENTS

A representative of the Sydney-based McGirn and Associates Pty. Limited will be in London on January 11 and 12 to interview prospective Employees for Assignments in Australia. Highly developed skills in data base, communications and transaction processing are required. I.B.M. CICS experience a distinct advantage.

Candidates accepted will receive £U.K. 9,000 to £U.K. 13,000 remuneration, return air fares for family and relocation allowances.

A detailed resume and references to support your in-depth experience will be required.

Telephone Peter Bailey on 01-989 0785 for an appointment. All inquiries treated in strictest confidence.

COMPUTER MANAGER

required by NALGO. Applicants must have ability to control, co-ordinate and develop the computer work of the Association, and be fully conversant with both the systems and operations aspects of computing.

Salary: £7488-£8228 p.a. including London weighting allowance.

26 days annual leave plus additional leave at public holidays. Partial mortgage interest rebate. Contributory pension scheme. Staff restaurant. Removal expenses.

Application forms and further details available on request from: The General Secretary, National and Local Government Officers Association, 1 Mabledon Place, London WC1H 9AJ.

Closing date for receiving completed application forms: 15 January 1979.

Make a small investment in the future.



2p hardly buys you a box of matches these days. But one of the things it could buy you is a quick phone call to Andy Mogg.

That phone call could lead to a better job. But it could lead to your experience, and your personality. With a better installation, in a company that's better equipped to meet your career growth you rightly expect.

And of course, better financially. Isn't that what investment is all about?

Managing Consultants, Project Managers, Project Leaders, Analyst Programmers

Approximately 100 consultants are called upon to advise on the systems of business and industry.

All ranges of experience needed, especially people with a background in business, finance, engineering, science, etc. Potential and ability to travel both abroad and here. Training facilities and salaries are excellent and negotiable. If you are a top man, you are a top man.

For more information, please phone Andy Mogg on the number below.

Operations

Feltham, Middx. 10 operations staff to set up a 4 shift system. They have 4x ICL 1900's and 2x ICL 2970's and hope to upgrade this year. Good salaries + 33% S/A. Excellent promotion prospects and lots of benefits.

So if you have 18 months-4 years' relevant experience and are interested phone Elaine Collis or Sally Oliver on the number below.

Dartford, Kent. IBM 370/158 C/S/VS1 or OS/MFT 12-18 with exp. £4K-£5K + company benefits. London, W1. IBM 4341 with 12x DGS/POWERVS 2 yrs exp. Good salary + lots of perks. Dover, Kent. Sm. Exp. IBM 4341. Pref. 3 yrs exp. Lots of perks. Salary £4000 onca.

All vacancies are open to both male and female applicants.

Knight Computer Services Limited

14 Old Park Lane, London W1Y 4NL. Telephone: 01-491 4706.

Please send me an application form:

Name:

Address:

Phone No:

Knight your kind of job, your kind of people.

Staff Services Division of B.C. Computer Group Ltd. 25, Abchurch Lane, London EC4N 3DF. A member of Computing Services Group Ltd.

Central Computing Consultants

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212 Telex 27950
DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 789577 (5 Lines)
Licensed annually by the Dept of Employment No SE(B)170



CICS
LONDON & IL COUNTIES
SALARY: £6-7.5K

International company requires COBOL or PL/I programmers with 10 years experience for the following UK locations: Central London, Herts, Hants, Bucks and Cheshire. Applications are commercial and the hardware is IBM 370/115 under OS. However DOS/VS programmers will also be considered if they are prepared to switch to OS. The client wishes to recruit project leaders, senior programmers, senior and junior programmers, 2-7 years PL/I or COBOL is required with a commercial environment. Some positions could involve UK travel. Salaries will be above average and dependent on experience. Database applications experience would be considered very advantageous.



COBOL
SOFTWARE HOUSE
LONDON E6-8K

A prestige Software House has immediate vacancies at their London head office and throughout the Home Counties for COBOL programmers at various levels of seniority. Amongst the numerous advantages of working for a Software House apart from higher pay are the scope and variety of projects, the opportunity of learning new languages and exposure to a range of hardware. These benefits can rarely be offered within an end user environment. You will certainly be called upon to shoulder more responsibility than you have done in the past and will be expected to exercise a degree of autonomy which if used to full benefit will give you a new horizon of freedom. Can you offer 2-5 years plus COBOL experience on any major manufacturers' main-frame or Mini computer?



MATRIX
360 Oxford Street
London W1N 9HA
01 491 4636

COMPUTER ENGINEERS

£6,000 + COMPANY CAR
U.K. subsidiary of progressive American company requires experienced Engineers to work a shift rota in a demanding environment.

The company, a leader in the field of Oil Exploration, is based in one of the nicest parts of Sussex.

Benefits include Pension Scheme, Life Insurance, Company Car and possibility of foreign travel as one's career develops.

For further details contact Ted Tinsley on East Grinstead 28111.

APPOINTMENT OF PRINCIPAL ASSISTANT (COMPUTERS)

SALARY GRADE SO(1) £5,232 to £5,568
Applicants are invited to apply for the post of Principal Assistant (Computers) to the Chief Executive of the Council. The holder of this post deputises for the Chief Executive in the absence of the Chief Executive. The holder of this post is responsible for the day-to-day running of the Council's computer system and for the management of the Council's computer resources. The holder of this post is also responsible for the management of the Council's computer system and for the management of the Council's computer resources. The holder of this post is also responsible for the management of the Council's computer system and for the management of the Council's computer resources.

APPOINTMENT OF PROGRAMMER/ANALYST (COMPUTER SECTION)

SALARY GRADE AP3 (£3,732 to £4,146)
Programmers with at least two years' experience in COBOL and/or PL/I are invited to apply for this post. Previous system analysis experience is desirable. The Council uses a 19011 Computer. Assistance will be given with housing relocation of required and approval removal expenses reimbursed. Commencing salary dependent on qualifications and experience.

Applications and further particulars of these posts can be obtained from the Personnel Officer, 3 River Walk, Merthyr Tydfil, Tel: 01443 3201 (ext. 218). Closing date for applications: 24 January 1979.

For further details contact **SELWYN JONES**, CHIEF EXECUTIVE AND TOWN CLERK, Merthyr Tydfil, Mid Glam.



SYSTEMS PROGRAMMER

Up to £7,200
PROGRAMMERS
Up to £5,500

Applications are invited for programmers to implement major systems now being designed to assist the Board's engineering activities. When fully operational the installation will consist of two ICL 2950 computers plus other machines for communications and telecontrol. Terminal access to this system will be available from 30 remote sites. The systems at present being designed include inventory and maintenance control systems, circuit file and a telecontrol system to monitor and control the HV system.

Applicants for the Systems Programmer post should have a knowledge of ICL Operating Systems and preference will be given to candidates with either George 2 plus or VME experience. The installation will initially run under DME and George 2 plus and progressively transfer to VME/K.

Applicants for the Programmer posts should be educated to at least 'A' level standard and have some programming experience in either COBOL or FORTRAN. Any necessary training will be given.

The post will be located at Head Office although some travel within the Board's area will be necessary. We offer a challenging opportunity to be involved in the early stages of a project using ICL's newest computer, a good salary, plus pension scheme.

Application forms can be obtained from the Secretary, Southern Electricity Board, Southern Electricity House, Littlewick Green, Maidenhead, Berks, which must be completed and returned, quoting 98/78 by not later than January 23, 1979.

COMPUTER SERVICES MANAGER

c. £6,300
Benn Brothers Ltd. require a Manager for their new and developing in-house computer department, consisting of two new 84K Mini's each with remote on-line terminals, all-disk storage, providing Sales Accounting, Payroll and Management services to the group, the vacancy occurring due to the promotion of existing staff.

The job is based at Tonbridge, Kent, only five minutes' walk from the shopping centre and station, and offers an excellent modern custom-built environment, prospects and other benefits.

Applicants should ideally have had a minimum of three years' DP and commercial experience, preferably with some knowledge of programming techniques — RPGII, and the personality for working closely with user departments. Experience of the publishing trade would be particularly useful.

Apply to: **Alan Francis, Benn Brothers Ltd., 14 Sovereign Way, Tonbridge, Kent TN9 1RW, or 'phone Tonbridge (0732) 364422, Ext. 277.**



Communicate with Racal

1979!!
A Change in Your Career?
A New House in the Country?
What About
Computer Aided Design
in GLOUCESTERSHIRE

Pleasantly situated adjacent to the Cotswold Hills in Tewkesbury Racal-Redac Limited develop software to produce complete Interactive Graphic based Computer Aided Design Systems using the DEC PDP11 Computer. Our systems are sold worldwide and are utilised in the design of Printed Circuit Boards and Integrated Circuits. We are now extending our expertise and developing advanced software for use in the design of the new breed of sophisticated LSI chips and microprocessors. We are also currently involved in producing a Computer Aided Mechanical Design System based on the DEC PDP11. This will entail considerable expansion in our Software Departments and consequently we have a number of opportunities for programmers at all levels.

Development Programmers
Applicants should hold a Science based degree or HNC qualification and have a working knowledge of Fortran or Assembler. Previous experience in a software environment is desirable although specific vacancies exist for newly qualified personnel. The programmers appointed will work in small teams on Development projects using a range of in-house computers.

Customer Service Programmers
In constant liaison with our customers, the Customer Service group provides a fast and efficient service using software to solve customers' day to day problems. The work is interesting and varied and sometimes entails visiting the customer's location both in the UK and Europe.

Customer Project Programmers
Customer Project Programmers work on short term projects from the initial analysis stages through to coding and testing to produce high quality software to meet the customers' specifications. This often involves introducing new items of hardware or adding new facilities to our already proven software. Applicants will hold a relevant degree or HNC qualification and must have had at least 12 months experience in a software environment. Promotion prospects are excellent as it is anticipated that continuing expansion will create additional Senior level positions in the future.

In addition to excellent starting salaries, Racal employment benefits include a Company Pension and Free Life Assurance Scheme and over 4 weeks annual Holiday. Relocation assistance will be provided in appropriate cases.

Please write enclosing details of age, experience and present salary to:
B. Ashcroft, Personnel Officer, Racal-Redac Limited, Newtown, Tewkesbury, Gloucester, GL20 8HE
or Telephone Tewkesbury 294161 for more information

COBOL
SOFTWARE HOUSE
LONDON E6-8K

SYSTEMS PROGRAMMERS
SOUTH-EAST & E.C.
E6-8K - £9-15K

A prestige Software House has immediate vacancies at their London head office and throughout the Home Counties for COBOL programmers at various levels of seniority. Amongst the numerous advantages of working for a Software House apart from higher pay are the scope and variety of projects, the opportunity of learning new languages and exposure to a range of hardware. These benefits can rarely be offered within an end user environment. You will certainly be called upon to shoulder more responsibility than you have done in the past and will be expected to exercise a degree of autonomy which if used to full benefit will give you a new horizon of freedom. Can you offer 2-5 years plus COBOL experience on any major manufacturers' main-frame or Mini computer?

Our client requires systems programming specialists ideally with main-frame experience including either ICL 2900, ICL 2200 or ICL 2100. Previous in-depth experience is a prerequisite. Our brief is to discover potential coupled with several years' current relevant experience for which our client expects to pay well above accepted market rates. These positions are permanent and education expenses will be covered to full degree applicable. The client is a market leader in advanced systems projects and is truly international in size and performance with offices throughout Europe, Australasia and the U.S. Interviews will be held in London.

SALES EXECUTIVE
c £10,000 + car ++
COMPUTER INSTRUMENTATION LTD (CIL) is a fast expanding Computer systems and peripherals manufacturer. We need an experienced salesman to handle our Northern UK area for plotting and draughting systems. You should have at least 2 years sales experience and ideally some experience with selling computer and graphics products. This is a senior appointment for a self-motivated salesman, with high prospects for the future. Ideally you should live in the Manchester to Leeds area.

Write or phone for an application form to **A. Luffman, Computer Instrumentation Ltd, Chandler's Ford, Eastleigh, Hants. Tel: (04215) 66321.**

FIELD SERVICE ENGINEERS
NEW OPPORTUNITIES
£6,000 + Overtime + Standby + Car + Training
New opportunities have arisen in LONDON, MIDLANDS, SCOTLAND and the SOUTH WEST as a result of expansion by a highly successful British systems company with over 2000 installations in 16 years of business. This young and dynamic company offers you the chance to develop your career in mini computers at the very top end of the market.

If you have or are looking for experience in mini computers and wish a stimulating environment with real prospects for future advancement and feel that you can handle the above challenge — call now!

Ref: EK 2102 (Consultants)
AB EXECUTIVE (KINGSTON) LTD. 01-546 9473

BRITISH AEROSPACE AIRCRAFT GROUP
Warton Division

COMPUTER PERSONNEL Maths Services
The Warton Division of British Aerospace is making major contributions to Europe's largest and most advanced aircraft programme, the tri-national Tornado multi-role combat aircraft, and to other important projects.
The following personnel are required to join a team working towards installing, in mid '79, an IBM 3032 under MVS/JES2/TSO alongside an ITEL AS5 and DEC PDP and VAX computers.

Computer Operations Manager
To manage the day-to-day running of the installation with particular emphasis on management of the 30 computer operators working a 3-shift system.
Applicants must be over 30 and have 5 years' experience in computer operations including management experience.

Systems Programmers
Staff with 2 years' relevant experience are required to join teams:
(i) generating, modifying and tuning an MVS/SE system with JES2/NJE and TSO/TCAM.
(ii) implementing and supporting systems on DEC PDP II's and VAX II/780's.

Computer Education Officer
To join a team providing programmer training using modern techniques including IBM's Interactive Instructional System.
Applicants must have 1-2 years' programming experience in FORTRAN on IBM systems.

Suitably qualified personnel (male/female) are invited to apply giving full details of their background and experience, quoting reference No. CW/1179.
There is a choice of rented housing at attractive prices in pleasant residential areas within comfortable commuting distance from Warton.

Mrs. E. A. Hall, Senior Personnel Officer, British Aerospace Aircraft Group, Warton Division, Warton Aerodrome, Preston, Lancs. PR4 1AX.

NEWCASTLE UPON TYNE POLYTECHNIC
Office of the Department
SYSTEMS ANALYST (Administration)
To be responsible for the design, development and maintenance of computer based information systems and related management services in connection with the University. The holder of this post is also responsible for the management of the University's computer system and for the management of the University's computer resources. The holder of this post is also responsible for the management of the University's computer system and for the management of the University's computer resources.

For further details contact **IVOR NORTON**, in confidence, quoting reference CW/79002.

LEEDS SYSTEMS ANALYSTS
to £5500 + bonus
PROGRAMMERS
to £4300 + bonus
Our client has a number of interesting vacancies for systems analysts and programmers.
The company is highly profitable and part of a major British industrial group and uses the latest ICL equipment.
The data centre in Leeds is the headquarters of the European arm of the Company and some infrequent travel could be involved.
The work is interesting and the installation is already well established and much of the work already processed is on-line. It follows that future developments will follow this pattern.
Excellent prospects, working conditions and promotion potential. Salary around £4300 for programmers and to £5500 for analysts PLUS BONUS.
Contact Ivor Norton, in confidence, quoting reference CW/79002.

IVOR NORTON Management Services Ltd
Recruitment Consulting Division
52 Shaftesbury Avenue, London W1V 2DE
01 734 8862 (24 hour answering service)
P.O. Box 114, Loughborough, Leics. LE11 1TS
Tel: Harrogate 66624

OPERATOR VACANCIES
EXCELLENT IN 1979!
TECHNICAL SUPPORT
to £4,500
Fed-up with shift working and you enjoy dealing with people? Then if you have T.P. experience on (preferably) IBM machine, apply now. This with a firm offers top grade perks plus full training facilities. CW 1-1.
HERTS
OPERATORS/SENIOR OPERATORS
to £4,200 inc. NR MILTON KEYNES
A major engineering firm (offering an excellent relocation package) wishes to recruit several GII or GII operators. Other top perks include excellent training, 4 weeks' holidays and non-C.P.S. with prospects of programming eventually. CW 1/2.
SENIOR OPS/SHIFT LEADERS
to £6,000 inc. NR FELTHAM
A major commercial user with an international reputation requires IBM operators with advanced IBM OS experience. Their very latest IBM equipment has a most up-to-date T.P. system, and therefore T.P. and JCL experience is a definite advantage. Perks include 4 weeks' holiday, paid overtime, free coffee, discounted BUPA scheme etc. CW 1/3.
UNIVERSITY OF LEICESTER
COMPUTER PROGRAMMER
Applications are invited from suitably qualified and experienced candidates for a newly established post of Computer Programmer in the central administration. The successful candidate will be involved in the technical development of an integrated computerised record and management information system which will be used by all principal areas of the University's administrative operations. The support of this development the University has recently installed an IBM 2434 computer (PDP 11/34 variant).
Applicants should have about two years' programming experience and be able to demonstrate a background of on-line integration of data processing with experience in interactive computing. Knowledge of Basic Plus would be an advantage.
Applicants will be made according to qualifications and experience at the scale of £3855-£5555 per annum.
Application forms and further particulars may be obtained from the Registrar, The University, Leicester LE1 7RH, to whom completed applications should be returned as soon as possible, deadline time 10.00 AM on 11.01.79.
Fareham Borough Council

INDALEX Analyst/Programmer
C £5,500 — Cheltenham
We have an ICL 2903 and EDS 30's.
We seek an experienced Analyst/Programmer (male/female) who can quickly contribute to the current projects such as, on line order entry, shop floor data collection (using 7602 comms kit) and implementation of a new payroll package.
Suitable applicants, should preferably have experience of Cobol and On Line Working. This Senior Staff position carries an attractive remuneration package. Please write with brief details to Mr. B. M. Chertfield, Personnel Manager, Indalex Limited, Kingsditch Lane, Cheltenham, Telephone 21641.

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FAREHAM BOROUGH COUNCIL
Borough Treasurer's Department
The Council's present computer installation is Honeywell 125 Disk and Magnetic Tapes to be replaced in mid 1979 with Honeywell Level 64/70 Disk and Magnetic Tapes. In conjunction therewith the Council proposes to expand their present team of Systems Analysts and programmers.
SYSTEMS AND PROGRAMMING MANAGER
Post T 90/2 Grade PD 1 (3-7) (£8060-£9702 per annum inclusive)
This is a new post. The person appointed will supervise a systems Analyst and Programmer team and be responsible for the design, specification, testing and maintenance of both on-line and batch systems. The ability to liaise with user staff at all levels is essential. Applicants should also have at least 5 years' experience at senior management level in developing computer applications.
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For application forms and further details

Systems Analysts & Programmers

West Country

Our Computer and Administration Centre provides the Debenhams Group with a complete range of management and financial services. Within the Centre the Systems Development Department develops and maintains a wide range of systems to support our business activities. Two ICL 1900 configurations are in use together with a pair of CMC Realtime systems.

Due to expansion in the Department we have vacancies for:

Systems Analysts c £5,000
Programmers c £4,000

Systems and Programming staff work in Paper Teams. Applicants, male and female, should have a minimum of three years' practical experience in systems analysis or programming (COBOL or BASIC). Candidates with significantly greater experience could be offered higher starting salaries.

Please write or telephone for an application form, together with a copy of the job description, and details of the excellent Company benefits, from:

Senior Personnel Manager, Debenhams Limited, Bedford House, Park Street, Taunton TA1 4DB

Debenhams

Numerate Engineers Analysts Programmers

The System Problem Analysis Group of Ferranti Computer Systems Limited is an expanding organisation that undertakes analytical and scientific programming tasks for external agencies (in the UK and Europe) and in support of Ferranti's Real-Time System Projects:

Our Work Includes:

- Signal Processing
- Target Tracking
- Fire Control Systems
- Computer Simulation
- Scientific Data Processing and Mathematical Analysis
- Control Systems
- Microprocessor Systems
- Sonar and Radar
- Active and Passive Gun and Missile
- Event and Time Based
- Continuous and sampled
- Design and implementation

We require new and experienced graduates in a numerate discipline to take part in our future expansion. Successful applicants will be capable of:

- making significant contributions in new fields
- communicating effectively
- liaison with customers

We can offer:

- high job interest
- flexible working hours
- competitive salaries
- paid overtime and bonus scheme
- early opportunities for responsibility
- friendly, informal atmosphere

If you feel you can meet the challenge that our kind of work offers, then please ring our Recruitment Officer on Bracknell 3232, ext. 471, or write quoting ref. no. D/884/CW to:

The Personnel Officer, Ferranti Computer Systems Limited, Western Road, Bracknell, Berkshire.

FERRANTI
Selling technology

datascene

Recruitment Advertising Consultant

£8,000 + Bonus + Car

Datascene Recruitment Limited is one of the leading computer Recruitment Specialists, handling positions in the computer industry at all levels up to senior management appointments.

We are currently looking for someone to take over existing clients and to build out new business in offering our recruitment package.

This will involve advising clients on advertising, presentation, telephone and network and then co-ordinating the response, interviewing applicants and presenting a curriculum vitae of each person. These are forwarded to the client for discussion on when to call applicants they wish to interview.

We require someone who has a background of either systems analysts or programming, a strong personality and a flair for being successful.

Company benefits include a good basic salary, bonus and a company car after an initial period. If you are interested and require further details contact Mike Daycey, No. 439 1856

Datascene Recruitment Limited
Capit House
140-142 Regent Street
London W1B 7FB
01-439 1856
24 hour answer phone



What we need is more people like George

In fact we need 84 more Georges (or Georgines) for our Geometric. Whether you're Geobal shaped or Assembler or Basic shaped - we need you. We also have opportunities waiting for Analysts, Analyst/Programmers in scientific or commercial environments. In short, opportunities in all D.P. areas.

We found George a job with a good future. He came to us because he knew we were one of the foremost Consultants in the West Country and would know about opportunities he would never hear of. You too could have a future like George in the West Country - phone us and start the New Year right.

ab Executive (Bristol) Ltd
Consultants
Telephone Bristol (0272) 426631



UNIVERSITY OF LONDON INSTITUTE OF EDUCATION PROGRAMMER A

Applications are invited for the above post in the Department of Statistics and Computing.

The successful applicant will be required to maintain and develop program libraries, to help and advise members of staff engaged in educational research, and to assist in running of Computing Courses for postgraduate students.

The Institute has a CDC 2000 User Terminal linked to the CDC 6000/7800 computers at the University of London Computer Centre, and to the Meroset. The terminal is at present staffed by a Senior Programmer and an Operator.

Programme experience in the Survey Analysis field is an advantage. The University of London Institute of Education, Bedford Way, London WC1M 0AL. Closing date: 15 January 1979.

UNIVERSITY OF LONDON INSTITUTE OF EDUCATION APPLICATIONS PROGRAMMER

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CONTROL DATA INSTITUTE

SALES EXECUTIVES

— WITH MANAGEMENT POTENTIAL —

COMPUTER INDUSTRY TRAINING

We lead the world in the provision of computer training and education technology. Our training centres are located in seven major cities within the United Kingdom and in the last four years we have provided extensive training services to all sectors of industry as well as training and finding over 2,000 new entrants to the computer industry under the sponsorship of the MSC TOPS retraining scheme.

As a result of promotion within our existing sales team, we are seeking highly motivated and self-sufficient people to sell our services to industry as well as having responsibility for selecting trainees and working closely with Government departments.

The candidates we require must be educated to degree level and should have previous sales experience, preferably in a service environment related to computers, recruitment or education.

These jobs provide the opportunity of joining a fast growing and successful organisation at the beginning of a new phase of development. Consequently, opportunities for advancement into management are a reality. Thorough training will also be provided.

These job opportunities will be located in NORTHERN and SOUTHERN ENGLAND and THE MIDLANDS.

Earnings in excess of £7,000 can be expected with the provision of a company car plus a variety of fringe benefits.

Please supply complete career details and quote reference CD1019 when applying to:

SMR Sales and Marketing Recruiters Ltd.,
Victory House,
99 Regent Street,
London, W1R 7HB.
Telephone: 01-734 9776



MORE THAN A COMPUTER COMPANY

UNIVERSITY OF EAST ANGLIA NORWICH Senior Lecturer/Lecturer Computing Studies

Applications are invited for the above newly established post which involves the further expansion in Computing Studies. Appointment will be at the senior level for a suitable qualified candidate. Preference will be given to candidates having appropriate experience and research interests in the following areas: micro computer systems, real time computing and data processing. However, applications with interests in any area of the material computing will be considered. The appointment will commence on 1 April 1979 or as soon as possible thereafter. The salary will be at an appropriate level on the Senior Lecturer scale currently £7,000 to £9,261 (as on the lecturer scale £6,892 to £7,754 (payscale) plus USS benefits.

Applications (one copy only) which should contain a full curriculum vitae including a statement of interests together with the names and addresses of three referees to whom reference may be made, should be sent to the post: Senior Lecturer in Computing, University of East Anglia, Norwich NR4 7TJ, not later than 12 January 1979. The terms of application are stated in writing three referees you are requested to provide the names of those who can immediately be approached by the University.

Metropolitan Borough of Wigan WIGAN COLLEGE OF TECHNOLOGY Department of Mathematics and Computing (for advertisement)

Applications are invited for the post of:

LECTURER IN COMPUTING

The successful applicant will be required to contribute lectures on Computer Science and Data Processing in various courses at sub-degree level. A knowledge of COBOL and a willingness to participate in some of the mathematics teaching of the department will be an advantage. Salary: Lecturer Grade 1 £4,192.15 to £5,124. Further particulars and application forms may be obtained from the post: Lecturer in Computing, Wigan College of Technology, Parsons Walk, Wigan WN1 1BB to be returned within 14 days of the date of this advertisement.

ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH, HANTS.

A Microcomputer system is to be used in the Navigation System Section of the RAE Division of the Royal Aircraft Establishment at Farnborough. The work required to be done on the system includes: commissioning, maintenance, and the collection, processing and analysis of data obtained from laboratory and flight trials. Some of this work is a current being carried on RAE's ICL 1900S running under George 4. Installation is required around September 1979. Applications for Operational Requirement should be made within two weeks of the publication of this advertisement. Applicants quoting CEH-22 should be made in: Central Computer Agency, Room 522, Riverbank House, Millbank, London, SW1.

THE SALES AND MARKETING BIT

WITH a quizzical look back at the old year and a cautious glance forward to the next 12 months, Trader puts his thoughts into seasonal vein and gives a salesman's view of the Twelve Days of Christmas.

On the first day of Christmas
A salesman sold to me
A microcomputer (for free!)

On the second day of Christmas
A salesman sold to me
Two mainframes (One can always sell off the spare capacity)

On the third day of Christmas
A salesman sold to me
Three disc drives (They should work okay, the carrier didn't drop them very hard)

On the fourth day of Christmas
A salesman sold to me
Four VDUs (Ignore that Control Data hedge, it must be a misprint)

On the fifth day of Christmas
A salesman sold to me
Five months late (You know how it is with British Rail)

On the sixth day of Christmas
A salesman sold to me
Six months delivery (One can absolutely rely on the manufacturer's delivery, must of the time)

On the seventh day of Christmas
A salesman sold to me
Seven language processors (Most of which are bug-free with the exception of Cobol, Fortran and Basic)

On the eighth day of Christmas
A salesman sold to me
Eight program packages (Which I have since discovered were originally customised programs written for our main competitor)

On the ninth day of Christmas
A salesman sold to me
Nine operators (Who use the machines for a dating bureau service in the evenings)

On the tenth day of Christmas
A salesman sold to me
Ten top consultants (From a top computer consultancy, the BCS had never heard of)

On the eleventh day of Christmas
A salesman sold to me
Eleven Systems Analysts (All of whom have now completed their correspondence course in systems design)

On the twelfth day of Christmas
A salesman sold to me
Twelve freelance programmers (Who recently secured recording contract as a punk-rock band)

PRODUCT NOTES

Ballistic print head

THE Lear Siegler 180 chps matrix printer, Model 210 RO, is now available from Peripheral Hardware of West Molesey, Surrey at £1,685.

The 7 x 9 dot matrix head has no cores attached to the print wires which travel ballistically and result in greatly increased head life. This head is positioned by a servo-controlled lead screw.

The electronics of the printer include a microprocessor and an input buffer. Once a line has been printed, if there is another complete line in the buffer, it will be printed in the reverse direction. This speeds up the effective print rate.

Fire-proof safe

MAGNETIC media, having a lower resistance to heat and steam, cannot be adequately protected in a document fire safe designed to protect paper.

PCA Data Processing Accessories Ltd (CWL) has designed and built a fire safe designed to protect magnetic media.

A Resguard fire safe is a changeable lock is fitted as standard. This offers 17 million variations and can be changed at any time.

Key take for this look are made in polished metal, are sealed in a container at source in the factory and delivered to the user unopened.

PCA Data Processing Accessories Ltd (CWL), 18 Graydon Place, London.

Puzzle Answer

2 + 2 + 1 = 2
1 + 1 + 1 = 3
1 + 1 + 1 = 2
3 + 3 + 1 = 7

IBM PROGRAMMING—CAREER DEVELOPMENT WITH ICI

ICI Fibres wishes to supplement its programming strength by the addition of two young persons who already have 2/3 years' programming experience using IBM 360/370.

Applicants, of either sex, aged between 22/32, will be required to demonstrate a good working knowledge of PL1 and/or Assembler using Michael Jackson structuring techniques and preference will be given to candidates with experience of data base/on line projects.

Experience with CICS/Adabas would be an added advantage, although not essential.

The Division's commercial and administrative functions are heavily dependent on computerised systems and the successful applicants will be expected to work to tight schedules in a variety of projects — both maintenance and development.

The Division has an IBM 370/158 located at its HQ in Harrogate.

Remuneration will be around £5,000 p.a. and other benefits include productivity bonus, profit sharing scheme and contribution towards re-location expenses to the Harrogate Area.

Please write, giving brief details of experience to: Miss A. B. W. Lyne, Personnel Department, ICI Fibres, Hookstone Road, Harrogate, or phone (0423) 68021, extension 477.

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Michelin is the world's leading radial tyre manufacturer, with to recruit two programmers to design, programme, implement and maintain computer based financial systems.

The work involves working with the mainframe installation at our St. Albans Manufacturing Unit and Commercial Offices throughout the U.K. and abroad. The successful candidate will be responsible for the design, development and implementation of COBOL programs.

Successful candidates will be offered a competitive salary and a comprehensive benefits package. The successful candidate will be offered a competitive salary and a comprehensive benefits package.

Applicants should send their curriculum vitae, together with a copy of their most recent salary slip, to: The Personnel Manager, Michelin Tyre Co. Ltd., 81 Fulham Road, London SW3 6RD, or telephone 07-589 1466 for an application form.

The Personnel Manager — Commage (Ref. JFG/CP/79), MICHELIN TYRE CO. LTD., 81 Fulham Road, London SW3 6RD, or telephone 07-589 1466 for an application form.

Computer Scientists earn their Stripes with Esso

Due to the increasing number and complexity of projects both in hand and imminent, our Research Centre at Abingdon — which specialises in fuels, lubricants, and additives — needs a technically-minded and creative man or woman to join a small team providing an efficient, and flexible computing service for our scientists and technicians.

Using the Centre's multi-terminal interactive PDP 11 System linked to the worldwide Exxon IBM 370 network, this team is responsible for all aspects of computer application and development arising from projects under investigation, including the use of mini-computers in data logging and real-time applications.

With a degree in Maths, Statistics, Chemistry, Electronics, Chemical Engineering, or an associated discipline, you must be able to appreciate the scientific problems encountered in our research — logically thinking them through to provide cost-effective computer solutions.

'At least one or two years' practical experience with systems or software is essential — preferably in a scientific environment. A statistical background would also be an advantage.

A competitive salary will be supplemented by a full range of benefits; and generous relocation assistance to this attractive rural area — just an hour away from London and only 20 minutes from Oxford — will be provided where appropriate.

Please write with full details, to: D.P. Sweeney, Employee Relations Service, Esso Research Centre, Abingdon, Oxon OX13 6AE. Or phone him on: 0235 21600.

Esso



MODCOMP has now established mini manufacturing and software development capabilities in the UK. As part of our continuing growth, we need the following people:

European Hardware Support

to £8,000 p.a.

Sales Engineer

to £8,000 p.a. basic

Sales Support

to £8,000 p.a. basic

Company benefits are excellent and include free BUPA and non-contributory pension. Relocation is possible.

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We wish to further increase our activities in the Midlands and need a super salesman to open up new markets from our Coventry office. It requires a proven background of successful selling within the mini market, preferably in an industrial environment. It will attract an aggressive salesman who wants to see good financial rewards for his efforts. There will be a basic salary plus commission scheme and company car.

We have already increased our sales force in the South of England and now require an additional pre-sales support analyst, to work from the Wokingham office. He/she will provide technical support to the sales force and will work on proposals, benchmarks, presentations, configurations etc. Suitable candidates will have a technical background on minis with particular emphasis on communications software, and will enjoy generating technical solutions to meet clients business needs. Benefits include a company car.

For further details ring ANNE CAMPBELL at (0734) 791 179 or send a resume to her at MODULAR COMPUTER SERVICES, Broad Street, Wokingham, Berkshire.

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REALTIME PROGRAMMERS

REALTIME DATA PROCESSING in WEST GERMANY

SESA is one of the top-ranking international firms specializing in the ANALYSIS, DESIGN and DEVELOPMENT of computerbased realtime systems.

In the course of realizing more than 400 such projects SESA has also developed an expertise in the management of large-scale complex Turnkey-systems.

We are seeking REALTIME-programmers in the following fields:

- NETWORK AND COMMUNICATIONS
- TRANSACTION - PROCESSING
- PROCESS-CONTROL

Applicants should have 3-5 years experience in the design and development of realtime-software. Experience in the following fields is essential:

- OPERATING SYSTEMS
- HIGH LEVEL LANGUAGES
- ASSEMBLER LANGUAGES

Knowledge of either PL1, ALGOL 68, BCPL or CORAL and at least one realtime-operating-system would be of advantage.

An excellent salary and fringe benefits will be part of the contract offered to the successful applicant.

Further conditions will be discussed during interviews which will be held in London in January 1979.

Please apply referring to this advert with full curriculum vitae to:

SESA-Deutschland GmbH
Lacobiistr. 7
D-4000 Düsseldorf 1
Mrs B. Lehmann

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 26 (Chock-a-Block)

We leave Chen to her fate, and return Hex who is a prisoner at Fort Ranfaun. He has been led up from the dungeons for a meeting with the mighty DPM.

HEX waited apprehensively in the starkly furnished office for the DPM to appear.

A disembodied voice filled the room. "Do you know why you are here?"

Recognition was instantaneous. There could be no mistake. It was the voice of his father, Abraham Synapse, alias Dr Null.

"You sound like my father," said Hex, "but you're not Dr Null."

"Right on both counts," came the reply. Hex looked around for the source of the sound. "Who are you? Why won't you show your face?" he asked.

"The Data Processing Manager has no face. I am the System Incarnate, representative of UNOS itself. I am purely procedural, untrammelled by the grossness of a corporeal embodiment. That is why I did not contradict you when you took me for your father (though certainly I am not Dr Null). You are all my children."

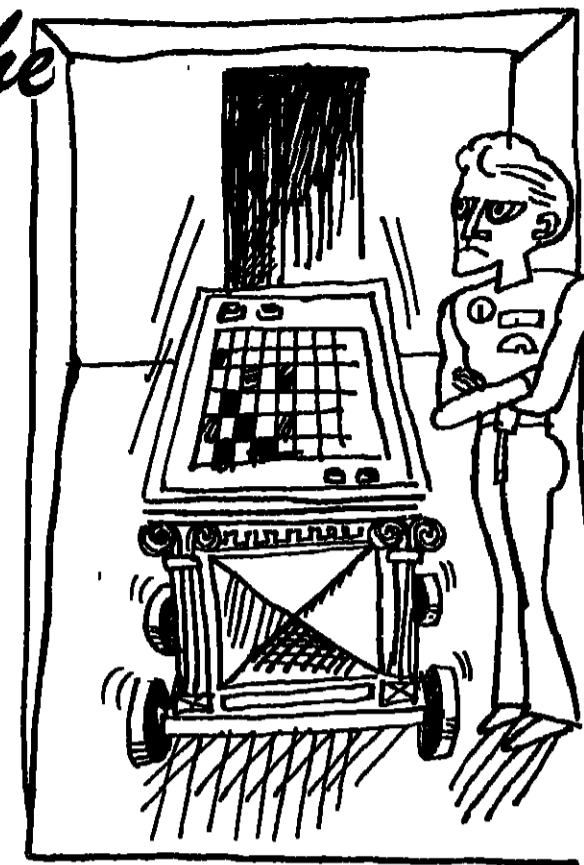
"Why have you stolen my real father's voice?"

"May I ask to whom you refer?"

"Abraham Synapse, creator of you and your ilk," replied Hex.

"You are in need of a short history lesson. Abraham Synapse was indeed one of the co-founders of the System, though not so pre-eminent among them as you seem to imagine, but neither are you his son, nor was 'Dr Null', as that fraudulent impostor styled himself, a relative of his, let alone the professor himself. If any may claim to be his descendant it is I, for his offspring were not flesh and blood. The man under whose malign influence you fell all too readily was none other than Igor Gligotski. He passed himself off under many guises. One of his impostures was to pretend to be Abraham Synapse, a pretence he could make superficially convincing because he had worked with Synapse in the USSR before being expelled. You were easily duped."

Hex had been expecting an attempt to discredit his father's memory, but not a slur as subtle as this; however, he was not going to give up his convictions. "Why then do



you, as System overlord, resort to his voice to cover your futility? Surely that substantiates his claim?"

"I am afraid not. This voice is just one among many. I wear it like a garment, partly for your sake, partly out of nostalgia. It was Gligotski, to give him his due, who designed the first practicable spoken output generator. When he fled Russia he pinched many of Synapse's ideas. In those days North America and Eurasia were deadly enemies, and he was welcomed with open arms. Consequently the North American Network, of which I am the logical outgrowth, was equipped with Gligotski's phonemic synthesizers. But I am no longer restricted to my native accent." The last sentence was spoken in Hex's own voice. This unnerved him more than anything the DPM had said.

"But why should he want to lie to me?"

"First because he needed a qualified successor; second because of his deep seated inferiority complex. He knew his inventions were little more than carbon copies, the real originator was his tutor, colleague and rival, Abraham

Synapse. On the one hand he aspired to emulate the professor, even taking his name; on the other he sought to denigrate his findings, and ultimately to destroy his work."

"Then who was my father?"

"Your biological father, for what it is worth, was a psychiatrist called Sigmund Zilch. He emigrated from Budapest to America shortly before your birth. You were born Samuel Zilch — no connection with Gligotski or Synapse. You owe allegiance to no one but me."

"Sam Zilch," murmured Hex, "that's the name I gave when challenged. I thought I made it up on the spot."

"A residual memory trace, no doubt, left over after cybernation."

"At least I'm still Sam," thought Hex. It was consoling to have one constant factor running like a thread through the labyrinth of his identity.

"Now it is time you answered my original question: do you know why you are here?"

"Because I was tricked by your clockwork copper, that pompous amateur psychologist, Extracode."

"That may be true, but it is not an answer."

"I don't know. You tell me."

"To play a game of chess, or rather two games."

"Chess?"

There was a whirring of well-oiled gears, and a panel at the back of the office slid open. An ornate carved table on wheels emerged from the recess, humming as it moved.

The DPM introduced it. "This is Checkmate (Chess Heuristic Evaluation Computer, Knowing Midgame And The Endgame). He has challenged you to a match. Scoring will be one point for a win, half for a draw. You will play twice, once with white and once with black. To win you need at least 1½ points; if the scores end level, the machine is the winner. If you succeed, the reward is a job on the Future System project; if you fail, you will go back to jail to await execution."

"What makes you so sure I want to work for you?"

"Let us discuss that after the game, shall we?"

The trolley drew up by Hex. On its top was a glass checker pattern. Images of the pieces in their initial configuration were projected from underneath.

"As a concession, you may choose whether to have white or black first," announced the DPM.

"I'll have white," stated Hex boldly. "And I shall need a second. If we're to do this properly, we must also agree on an impartial referee. I nominate McNull as my second and Simula as referee."

"You are in no position to lay down terms."

"Then I won't play," Hex was gambling. If the DPM took so much trouble to arrange a game, there had to be an ulterior motive.

"Very well, the game is forfeit."

The main door opened. Hex's remark about re-entered. "Take him back to the cello," ordered the DPM.

"Chew!" shouted Hex as they dragged him away.

Has Hex been rooked? Find out next week.

By Richard Forsyth

SALES ENGINEER COMPUTER SERVICES

Applicants are invited to fill this new position created as a result of our further expansion. We are looking for someone who has already gained experience in selling in the Computer Services Sector and wishes to join a successful international group whose activities are totally related to selling third party computer hardware maintenance to manufacturers O.E.M.'s and End Users.

The successful applicant will join a small but dedicated team operating from our Head Office in Feltham, Middlesex and must be willing to travel throughout the U.K. and occasionally overseas.

An attractive salary will be negotiated and a contributory Pension Fund is in operation. A Company car will be supplied for your full time use.

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The European Marketing Manager, Systems Maintenance and Services Limited, P.O. Box 13, Unitair Centre, Great South West Road, FELTHAM, Middlesex. TW14 8NT.

UNIVERSITY OF HONG KONG CHAIR OF COMPUTER SCIENCE

Applications are invited from suitably qualified candidates for the Chair of Computer Science. The holder is expected to be established from 1 September 1979. Annual salary (including pension) is HK\$140,000 (US\$18,000). Further particulars may be obtained from the Secretary and Registrar, University of Warwick, Coventry CV4 7AL, to whom written applications (no forms) naming three referees should be sent by 15th January 1979. Please quote Ref. No. 20/B/78.

UNIVERSITY OF WARWICK DATA PROCESSING OFFICER

Applications are invited from suitably qualified candidates for the post of Data Processing Officer in the University Central Administration, to be established from 1 September 1979. Salary will be on the Grade II scale (US\$17,764 p.a. under forward). Further particulars may be obtained from the Secretary and Registrar, University of Warwick, Coventry CV4 7AL, to whom written applications (no forms) naming three referees should be sent by 15th January 1979. Please quote Ref. No. 20/B/78.

COBOL PROGRAMMERS

Gresham Life require an additional programmer to work on their new life assurance system based on a Hewlett Packard 3000 Series 2 computer. The system operates in on-line and batch modes utilising data base techniques.

Applicants, male or female, should have a minimum of one year COBOL programming experience in a commercial environment. Experience of data base applications and interactive

program development would be an advantage.

A salary of £4,000-£4,750 depending on experience is offered together with other valuable fringe benefits, including relocation expenses (if appropriate), non-contributory pension, free life and sickness assurance, flexible working hours and luncheon vouchers. Career prospects are excellent and include the opportunity to be involved in a new system as it develops. Write or phone—

Gill Pulling, Personnel Department, Gresham Life Assurance Society Limited, P.O. Box 1, 2-6 Prince of Wales Road, Bournemouth BH4 9HD. Tel: 0202 767655.

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BOOK REVIEWS

An aid to reading technical literature

Ocran's Acronyms: A dictionary of abbreviations and acronyms used in scientific and technical writing, by Emanuel Benjamin Ocran. 262pp. £8.75. Routledge and Kegan Paul.

UNDERSTANDING abbreviations and acronyms is always a problem in reading technical literature, particularly in computing, and therefore a good dictionary of these would be extremely useful. A librarian at the Civil Aviation Authority, Emanuel Ocran, has compiled this volume by scanning journals in the Science Reference Library and his own library over the last two to five years, classifying the abbreviations under a range of headings such as Aeronautics, Behavioural Sciences, Geosciences, and so forth.

Since such a book involves no style or expository skill, it can only be judged on its completeness and accuracy. As a fairly quick test of these, I thought of some non-obvious but significant abbreviations in the computer field and checked to see if they were included. A surprisingly large number were not.

Among those missing were: APL, CAPS, HDLC, SNA, PTT, and BCPL. MOS is given under Computer Sciences, but CMOS is only under Electrical Engineering. PBX is under Computer Sciences but not under Communications. SDI is not under Information Retrieval, and is given two different definitions: Select Dissemination of Information (Computer Sciences) and Selective Dissemination of Information (Photography). The first is obviously a mistake.

Thinking of a few examples outside computing: TDC (Top Dead Centre), TNT, and Sonar are missing, as is Quasar. (It does give QRS and QSS, which it defines as Quasi Stella Radio Sources and Quasi Stella Sources; they should of course be Stellar — Stella was Jonathan Swift's girlfriend! There are plenty of abbreviations from the Apollo programme but of those I recall from television programmes, AOS, LOS, and DOI are not in the dictionary.

I also spent some time just leafing through the book at random, and the number of errors that I noticed is probably the most disturbing aspect of this work.

Some of the mistakes are quite comical, apparently in Lunar Sciences CM means

Command Module. A subject heading referred to several times is Data Science, which is something I have never heard of. Some of the classifications are most mysterious: why should AC be under Mathematics, Inhibitory Post Synaptic Potentials under Management, and Apollo Lunar Surface Experiment package not under Lunar Sciences?

If a cursory examination finds as many mistakes as this, one can only assume that in actual use a great many difficulties would

arise. Clearly the author's approach is unsound. He should at least have had people knowledgeable in each subject field check through the material, just to spot the glaring errors and omissions. Use of the thesaurus-generation software, a well-established technique now, would also help to make the book more consistent.

I did learn one interesting fact: in Dairy Sciences, BWP stands for Brown Wrapping Paper.

RORY JOHNSTON

Choosing A Computer 1978/79, by Clare Smythe and Paul Broadhead. 272pp. £8 (free to subscribers to "Data Systems"). Embankment Press.

FOR several years, the publication "Choosing a computer" has been a valuable desk-side companion to the DPM. Among many other admirable qualities, it included a comprehensive list of equipment manufacturers covering such basic information as price, power and performance.

Unfortunately, this practical formula has been abandoned, and the latest edition falls far short of expectations. Contents are selective, often inaccurate and frequently irrelevant. The new book incorporates a Conference and Exhibition Year Planner, covering the period April 78 to April 79. As can be expected in a volume already somewhat dated on publication, conference activity listing is somewhat sketchy beyond November 1978.

The chief criticism of the book — one which it must be admitted applies to many such publications — is the lack of a clearly defined

target area. Despite the title, the book is clearly not designed for the first-time user, becoming involved as it does in the complexities of European PTTs, and Frequency and Time Division Multiplexing. The choices as seen by the editors are limited to mainframe or visible record computing, with the alternative being a bureau.

Apart from the omission of the mini and micro, content balance seems arbitrary. While three paragraphs are granted to leasing over two pages are devoted to second-hand equipment,

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15 years' knowledge

Database organisation for data management, by Sakit Ghosh. £23.10 Academic Press Inc. (London) Ltd, 24-28 Oval Road, London, NW1 7DX

THIS book contains most of the knowledge gained by the author during his 15 years with the research division of IBM. It uses basic mathematical concepts to describe data, and characterises the hardware for storing data and development techniques for storing, retrieving and modifying data.

It is a useful mathematical treatment of the methods of storing and accessing data on large computers.

GEORGE BAKER

Comprehensive account of Pascal

Programming in Pascal, by Peter Grogono. 359 pp. £7.30. Addison-Wesley.

DISAGREEMENT with the first sentence did not leave me in the best frame of mind to perform an objective appraisal of this book. However, by the time I had reached the final section (with its pungent mention of Simula) my fear that this would be just another passenger on the Pascal bandwagon had been firmly dispelled.

This book contains a comprehensive account of the Pascal programming language, and a good deal more besides. The syntactic and semantic issues are in-

terspersed with perceptive suggestions on good practice and style. In addition to the language description, the book encompasses various other topics, including worthwhile introductions to list and tree structures and program verification.

On sensitive issues such as top-down versus bottom-up, global variables and GOTO statements, the author adopts a middle of the road attitude, achieving a comfortable balance between pragmatism and dogma. I would dispute the author's claim that this book is suitable for readers with no prior knowledge of a programming language. The author has a slight tendency to make points by inference rather than positive statement, leaving the reader to draw conclusions from the examples. Fortunately, this minor defect is largely compensated by the presence of many pertinent and sometimes quite elaborate examples. Programming in Pascal has been produced from the author's canon-ready copy prepared, apparently, on an electric typewriter. In view of its method of production I feel that at £7.50 (paper back) the book is somewhat over-priced, but nevertheless in terms of content much better value than some of its contemporaries.

R. KEE

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"Right on both counts," came the reply.

Hex looked around for the source of the sound. "Who are you? Why won't you show your face?" he asked.

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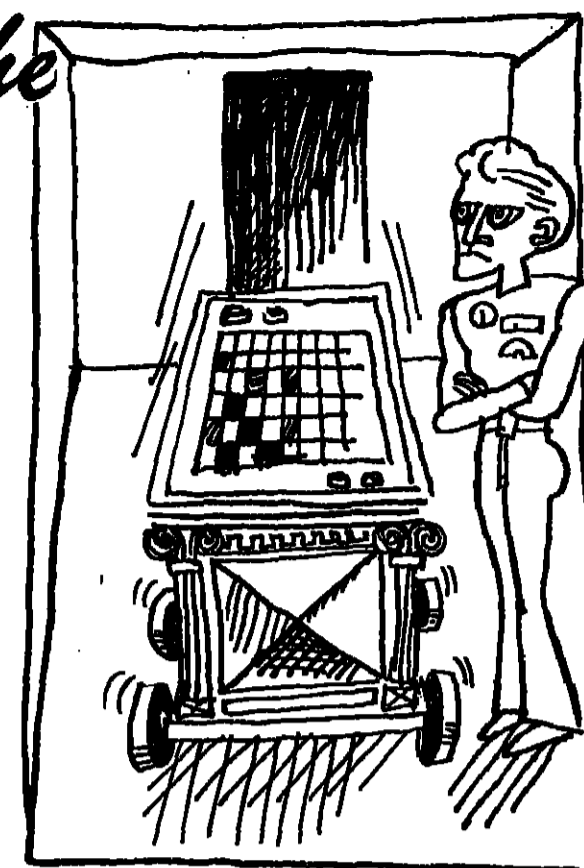
"Why have you stolen my real father's voice?"

"May I ask to whom you refer?"

"Abraham Synapse, creator of you and your ilk," replied Hex.

"You are in need of a short history lesson. Abraham Synapse was indeed one of the co-founders of the System, though not so pre-eminent among them as you seem to imagine, but neither are you his son, nor was 'Dr Null', as that fraudulent impostor styled himself, a relative of his, let alone the professor himself. If any may claim to be his descendant it is I, for his offspring were not flesh and blood. The man under whose malign influence you fell all too readily was none other than Igor Gligotski. He passed himself off under many guises. One of his impostures was to pretend to be Abraham Synapse, a pretence he could make superficially convincing because he had worked with Synapse in the USSR before being expelled. You were easily duped."

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you, as System overlord, resort to his voice to cover your facelessness? Surely that substantiates his claim?"

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"But why should he want to be to me?"

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Synapse. On the one hand he aspired to emulate the professor, even taking his name; on the other he sought to denigrate his findings, and ultimately to destroy his work."

"Then who was my father?"

"Your biological father, for what it is worth, was a psychiatrist called Sigmund Zlich. He emigrated from Budapest to America shortly before your birth. You were born Samuel Zlich — no connection with Gligotski or Synapse. You owe allegiance to no one but me."

"Sam Zlich," murmured Hex, "that's the name I gave when challenged. I thought I made it up on the spot."

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"Chess?"

There was a whirling of well-oiled gears, and a panel at the back of the office slid open. An ornate carved table on wheels emerged from the recess, humming as it moved.

The DPM introduced it. "This is Checkmate (Chess Heuristic Evaluation Computer, Knowing Midgame And The Endgame). He has challenged you to a match. Scoring will be one point for a win, half for a draw. You will play twice, once with white and once with black. To win you need at least 1½ points; if the scores are level, the machine is the winner. If you succeed, the reward is a job on the Future System project; if you fail, you will go back to jail to await execution."

"What makes you so sure I want to work for you?"

"Let us discuss that after the game, shall we?"

The trolley drew up by Hex. On its top was a glass checker pattern. Images of the pieces in their initial configuration were projected from underneath.

"As a concession, you may choose whether to have white or black first," announced the DPM.

"I'll have white," stated Hex boldly. "And I shall need a second. If we're to do this properly, we must also agree on an impartial referee. I nominate McNull as my second and Simula as referee."

"You are in no position to lay down terms."

"Then I won't play." Hex was gambling. If the DPM took so much trouble to arrange a game, there had to be an ulterior motive.

"Very well, the game is forfeit."

The main door opened. Hex's robot escorts re-entered.

"Take him back to the cells," ordered the DPM.

"Cheer!" shouted Hex as they dragged him away.

Has Hex been fooled? Find out next week.

1979 Richard Forsyth (Bar)

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BOOK REVIEWS

An aid to reading technical literature

Ocran's Acronyms: A dictionary of abbreviations and acronyms used in scientific and technical writing, by Emanuel Benjamin Ocran. 262pp. £8.75. Routledge and Kegan Paul.

UNDERSTANDING abbreviations and acronyms is always a problem in reading technical literature, particularly in computing, and therefore a good dictionary of these would be extremely useful. A librarian at the Civil Aviation Authority, Emanuel Ocran, has compiled this volume by scanning journals in the Science Reference Library and his own library over the last two to five years, classifying the abbreviations under a range of headings such as Aeronautics, Behavioural Sciences, Geosciences, and so forth.

Since such a book involves a style or expository skill, can only be judged on its completeness and accuracy. As a fairly quick test of these I thought of some non-obvious but significant abbreviations in the computer field and checked to see if they were included. A surprisingly large number were not.

Among those missing were: APC, CARS, HDLC, SNA, PTT, and BCPL. MOS is given under Computer Sciences, but CMOS is only under Electrical Engineering. PBX is under Computer Sciences but not under Communications. SDI is not under Information Retrieval, and is given two different definitions: Select Dissemination of Information (Computer Sciences) and Selective Dissemination of Information (Photography). The first is obviously a mistake.

Thinking of a few examples outside computing: TDC (Top Dead Centre), TNT, and Sonar are missing, as is Quasar. (It does give QSRs and QSS, which it defines as Quasi Stella Radio Sources and Quasi Stella Sources; they should of course be Stellar — Stella was Jonathan Swift's girlfriend! There are plenty of abbreviations from the Apollo programme but of those I recall from television programmes, AOS, LOS, and DOF are not in the dictionary.

I also spent some time just leafing through the book at random, and the number of errors that I noticed is probably the most disturbing aspect of this work.

Some of the mistakes are quite comical. Apparently in Lunar Sciences CM means

Command Nodule. A subject heading referred to several times is Data Science, which is something I have never heard of. Some of the classifications are most mysterious: why should AC be under Mathematics. Inhibitory Post Synaptic Potentials under Management, and Apollo Surface Experiment under Lunar Sciences?

If a cursory examination finds as many mistakes as this, one can only assume that in actual use a great many difficulties would arise.

RORY JOHNSTON

Clearly the author's approach is unsound. He should at least have had people knowledgeable in each subject field check through the material, just to spot the glaring errors and omissions. Use of thesaurus-generation software, a well-established technique now, would also help to make the book more consistent.

I did learn one interesting fact: in Dairy Sciences, BWP stands for Brown Wrapping Paper.

RORY JOHNSTON

Falls far short of expectations

Choosing A Computer 1978/79, by Clare Smythe and Paul Broadhead. 272pp. £8 (free to subscribers to "Data Systems"). Embankment Press.

FOR several years, the publication "Choosing a computer" has been a valuable desk-side companion to the DPM. Among many other admirable qualities, it included a comprehensive list of equipment manufacturers covering such basic information as price, power, and performance.

Unfortunately, this practical, formula has been

abandoned, and the latest edition falls far short of expectations. Contents are selective, often inaccurate and frequently irrelevant. The new book incorporates a Conference and Exhibition Year Planner, covering the period April 78 to April 79. As can be expected in a volume already somewhat dated on publication, conference activity, listing, is somewhat sketchy beyond November 1978.

The chief criticism of the book — one which it must be admitted applies to many such publications — is the lack of a clearly defined

15 years' knowledge

Database organisation for data management, by Saki Ghosh. £23.10. Academic Press Inc (London) Ltd, 24-28 Oval Road, London, NW1 7DX.

THIS book contains most of the knowledge gained by the author during his 15 years with the research division of IBM. It uses basic mathematical concepts to describe data, and characterises the hardware for storing data and development techniques for storing, retrieving and modifying data.

It is a useful mathematical treatment of the methods of storing and accessing data on large computers. GEOFFREY BAKER

Comprehensive account of Pascal

Programming in Pascal, by Peter Grogono. 359 pp. £7.50. Addison-Wesley.

DISAGREEMENT with the first sentence did not leave me in the best frame of mind to perform an objective appraisal of this book. However, by the time I had reached the final section (with its poignant mention of Simula) my fear that this would be just another passenger on the Pascal bandwagon had been firmly dispelled.

This book contains a comprehensive account of the Pascal programming language and a good deal more besides. The syntactic and semantic issues are in-

terspersed with perceptive suggestions on good practice and style. In addition to the language description, the book encompasses various other topics, including worthwhile introductions to list and tree structures and program verification.

On sensitive issues such as "top-down" versus "bottom-up" global variables and GOTO statements, the author adopts a middle of the road attitude, achieving a comfortable balance between pragmatism and dogma.

I would dispute the author's claim that this book is suitable for readers with no prior knowledge of a programming language.

The author has a slight tendency to make points by inference rather than positive statement, leaving the reader to draw conclusions from the examples. Fortunately, this minor defect is largely compensated by the presence of many pertinent and sometimes quite elaborate examples.

"Programming in Pascal" has been produced from the author's camera-ready copy prepared, apparently, on an electric typewriter. In view of its method of production, I feel that at £7.50 (paperback) the book is somewhat over-priced, but nevertheless, in terms of content, much better value than some of its contemporaries. R. KERR